FIG. 1.—MEN'S FIRST-CLASS SWIMMING BATH, KENNINGTON ROAD BATHS.

PUBLIC BATHS AND WASHHOUSES.

By A. Hessell Tiltman [*F.*].

Read before the Royal Institute of British Architects, Monday, 6th February 1899.

In response to an invitation from the Council of the Institute, I have undertaken the pleasurable duty this evening of reading a Paper upon Public Baths and Washhouses. There are two ways of honouring such an invitation: one, and by far the easier, is to describe the plan and construction in some detail of these establishments as we most frequently see them; the other is to define the principles which I think should govern their arrangement, especially under the very different conditions which now surround this problem, as distinguished from those under which the "Baths and Washhouses Act" and some of its earlier supplementary Acts were passed. To do the first would, I think, be paying my professional brethren a bad compliment, and would also indicate on my part the reverse of that frankness which should be the first consideration of the reader of such a Paper.

I think you will prefer rather to listen, with such attention as they may appear to deserve, to my personal views upon the ordinances which should govern the arrangement of Baths and Washhouses in the future, and their influence upon the arrangement and details of their various departments. My many years' experience in the planning, erection, and administration of these establishments will, I trust, be some excuse for my temerity in submitting the following observations.

The "Baths and Washhouses Act" was passed in 1846, in order, in its own words, "to encourage the establishment of Public Baths and Washhouses." Under the provisions of this and its amending Acts a very large number of these establishments have been erected in London and the provinces. From the inception of the first of these Acts up to the present time the Baths and Washhouses movement, as it is called, has made great and constantly increasing progress, until now it threatens to become almost unmanageable. Yet, in spite of this fact, it cannot be contended that the municipal duty of providing facilities for the cleansing of the bodies and linen of the poor is adequately performed. If the statistics of attendances are properly analysed, it will be found that but a small proportion of the class for which these establishments were chiefly intended avail themselves of the opportunities offered. The reasons to my mind for this partial failure in the administration of the Acts are—first, that the initial distribution and classification of the establishments are very frequently at fault; and, secondly, that sufficient effort is not made to educate the masses as to the necessity and benefits of the bathing habit.

I have endeavoured for some years past to draw attention, both in and out of the public press, to the necessity for some changes in this respect; and I am in hope to-night that one result of the reading of this Paper and its discussion may be the endorsement by members of the Institute of some of the suggestions which I propose offering for their consideration. Most able and sincere as have been the efforts made by the various Public Baths Authorities, yet they make almost invariably one and the same mistake. In promoting these establishments they very seldom consider the proper adaptation of the "Baths and Washhouses Acts" to the needs of the various sections of the *whole town or district* before commencing any of their building operations. There is a disposition, too often, to deal with the problem in a piecemeal fashion, and generally to follow the examples of neighbouring parishes or districts, with the result that they constantly repeat the old faults, introducing sometimes new ones of their own.

With the large amount of ground to cover in the short time at my disposal, I do not propose to dilate upon the necessity or advantage of the bathing habit, both to rich and poor alike, nor to its beneficial effect upon the health of the community generally; neither is it my intention to describe the historical features of ancient and modern baths. As regards the ancient Roman Baths, you can do nothing better than read the learned description of our esteemed President, given in his lectures to the students of the Royal Academy in 1889.* Of the development of our modern English institutions of baths and washhouses there are interesting records in the writings of Messrs. Whichcord, Metcalfe, Baly, Turner, and others; besides which there is an extensive amount of literature upon the bathing habits and establishments of other European countries, all of which are well worth perusal.

The primary duty which devolves under the Acts upon our various Bath and Washhouse Authorities is that of providing adequate facilities for the cleansing of the bodies and linen of the poor, and that, too, in such manner and form as not only to meet the requirements of those who have cleanly habits, but more particularly to educate and encourage those who have not been so trained. In the use made of our present establishments this duty I have already stated is but partially performed, owing chiefly to their initial faulty distribution. Practically the bathing community to be catered for may be divided into three classes—viz. the middle class, the working class, and the very poor; and it is the association of all these in large proportions, for all purposes of swimming, bathing, and washing, in almost every establishment, that I consider is the great initial blunder. The result of this

* See also "The Roman Thermæ," by Professor Aitchison, TRANSACTIONS, N.S., Vol. II. p. 105.

over-centralisation of all departments is practically that the legitimate requirements of not one of them are properly met; and nearly every department of the establishments so arranged suffers from this mode of treatment, which is the reverse of economical to the rate-payers at large.

What I think is required to correct the faults complained of is the practical adoption of some system of Central and Branch Establishments, classified and distributed to suit the special needs of each district. The visitors to our swimming and the best of the ablutionary baths may very reasonably be expected to go any distance within a mile or so for their bath, whereas those using the public washhouse are seldom found to come from within a greater distance than a quarter of a mile, and never beyond half a mile. The cleansing baths, especially those for the very poor, should be within an equally convenient distance. This being so, it would appear as if the ablutionary baths and the public washhouses should be decentralised and located at much more frequent intervals throughout those districts requiring them, forming really a series of Branch Establishments; whilst the swimming baths, providing larger and even better accommodation than at present obtains, should constitute Centralised Establishments at one or more points, equally dividing up the whole district.

The Central Establishment thus suggested would be the chief and most attractive of the establishments of the district. Its accommodation would consist of four swimming baths, and possibly a small teaching pond, to be used alternately by either sex of bathers; and with these might be associated a number of slipper baths, and a suitably arranged installation of hot-air baths. It would also accommodate the head offices of the general district administration, as well as the towel laundry for the cleaning of the towels, drawers, &c., of this and all the smaller establishments. Its site would naturally call for some prominence in one of the chief thoroughfares, and all extraneous advertisement of the Central and Branch Establishments might very well be concentrated upon it.

I have divided the Branch Establishments into one of two given types, which I shall call for convenience "A" and "B." The buildings, accommodating establishments of either type, differ in almost every particular from the central one. In the first place, they are much smaller in size, and are very compactly arranged, requiring sites of small area and of no special prominence. They should be placed at such frequent intervals as not to exceed a distance of half a mile of any bather or washer throughout the poor and populous districts.

Branch Establishment, Type "A" (Baths and Washhouses).—This would consist of buildings accommodating from 30 to 50 slipper and douche baths, and a public washhouse of from 30 to 50 washing compartments. Its business would be carried on at very similar rates, as in corresponding departments of our present establishments. Generally speaking, the public washhouse (and possibly some of the women's slipper baths) would occupy the ground floor, and the men's slipper baths the first floor.

Branch Establishment, Type "B" (People's Baths).—These would consist of small buildings arranged in a very similar manner to the Continental type of people's baths. The accommodation would consist almost entirely of the warm and cold douche or shower bath (from twenty to thirty in number) of the so-called Lassar type now being so largely adopted throughout Germany, Austria, and the United States.

The Branch Establishments of either type could readily be put upon the site of from two to four *small* houses of many of our bye-streets. Such sites would, comparatively speaking, be neither costly nor difficult of acquisition. Many of you will know what a very costly, dilatory, and troublesome proceeding it is to secure sites for our present establishments.

It will be seen, I hope, that with establishments of varying scale, and of three different principles of arrangements as here suggested, the wants and means of all classes of visitors

to our rearranged bathing and washing institutions are properly provided for; and, as in the Branch Establishments, the buildings are placed within very short distances of the homes of the working and poorer classes; and are, moreover, small in size, and would, I feel confident, be found economical in working. Our present large and ornate establishments, placed at great distances apart, and in very prominent positions, do not by any means sufficiently attract the very poor bather, who more often than not fights shy of being seen to enter them.

Many of our Metropolitan parishes and provincial towns have one, two, or more sets of baths and washhouses that would serve for these Central Establishments. I respectfully suggest to the authorities that before extending their provision of these admirable institutions any further they should consider the advisability of doing so in the direction of the Branch rather than the Central Establishments.

It is sometimes said that the administration and maintenance of these smaller buildings would be proportionately more expensive than those on a larger scale; but I am confident that the reverse of this would be found to be the case. Within the last four years I have visited very many of the baths and washhouses of the United Kingdom, France, and Belgium, and in the autumn of last year I visited and inspected no fewer than fifty-six of the public baths, of various arrangements and sizes, of Germany, Austria, and Hungary. In Germany I found very much to admire in the arrangement and administration generally of these institutions by the State; and I came to the conclusion, as the result of my trip, that whilst in many of the excellent features of our own establishments we need fear no competition, German or otherwise, yet the true spirit and intention of the "Baths and Washhouses Acts" would be much better carried out by adopting some of the practices of this country than by an obstinate perseverance in our present somewhat blundering system.

The United States of America have recently awakened to the great importance of this question to their own country; and a committee of medical and other experts, called "The Mayor's Committee for Public Baths of New York," recently, after careful investigation, rendered a most exhaustive report upon the system employed in the public bathing establishments in the various European countries. Their views, as stated in a report of great length, are not entirely favourable to our pretensions in this matter; and, in the result, their general preference is for the arrangement and administration of the new form of German and Austrian people's baths. They specially commended the new "Rain Douche Bath" as almost universally practised in these countries. One of the resolutions of their report is to the following effect: "That the spray or rain system of baths be adopted because, primarily, there is no waste of water; in the second place, the cost of erection is very moderate; and lastly, it is characterised by cleanliness and simplicity." The bath referred to is simply a gentle shower of water, the temperature and force of which are easily regulated by the bather, the water at once running off into the open drain under footboard. On the walls are copies of the plans of one of the new public baths now being erected in New York in accordance with the recommendation of the report.

The distinguishing features of the German and Austrian baths may be briefly summed up as follows:—

Open-air river baths are very largely adopted, some of them being upon a very large scale. On the walls will be found drawings of a very good example of one at Hamburg. The general establishments, especially the most recent ones, are much smaller than our own, and are placed at much more frequent intervals. A small proportion of these only have swimming baths attached, and in these cases the ponds are fewer in number and smaller in size. No bather, be he rich or poor, is permitted to enter a swimming pond until he has carefully washed himself, from head to foot, under the warm douches, and, if necessary, used the foot-

bath. The dressing-boxes are almost invariably arranged upon what I call the "back-corridor" system; an arrangement, however, that to my mind possesses no single advantage, whilst it adds unnecessarily to the size of the swimming hall, and moreover for any large attendance of bathers it is very difficult of supervision. These dressing-boxes are placed upon both the lower and the upper floors (when there is a gallery); and there is an abundance of open dressing places provided for school children in addition. Altogether this dressing-space accommodation in proportion to the superficial area of pond surface is much greater than in our own swimming baths. The ponds are neither by size, shapes, nor fittings suitably arranged for swimming contests, which I was told usually took place in the much larger ponds in the river baths.

The lighting generally is not so good as that of our own, but the warming and ventilation are far in advance; and the same may be said of the general and mechanical engineering work of the establishments. These ponds are kept open all the year round; but this is rendered easy by their small size, and the general excellence of the warming arrangements both in and out of the water.

It was stated very recently in one of the leading daily papers that the water in the ponds of the German baths was invariably cleaner than that in our own. This does not agree at all with what I saw. Owing to the ponds not being lined with white glazed bricks or tiles, but more especially to the difference in the practice of filling them, the water is not so clean in appearance, and is therefore very much less attractive than the beautiful pellucid water of many of our London bath ponds. A very curious effect, different from anything I have seen or known, is to be found in the swimming ponds of the beautiful new public baths at Frankfort. The inside of these is lined throughout with tiles of a bright cobalt-blue tint, from the top water-line downwards. This gives to the pond the appearance of a large vat of liquid starch; and the effect was by no means pleasant to my mind. I was told the reason of the adoption of such an expedient was that the colour of the water when turbid should not be perceptible; a reason that in England would, I venture to say, have secured the immediate rejection of such a tricky treatment of the pond lining.

In many of the establishments there are installations of hot-air baths of the kind commonly called with us "Turkish Baths," but in these countries denominated "Roman-Irish Baths." These hot-air baths were usually supplemented by a Russian (or vapour) bathroom, opening out of the same cooling and douche rooms as the former. In Germany the process of these baths is very similar to those of this country, but in Austria and Hungary the shampooing is omitted (unless specially asked and paid for), a second plunge of intermediate temperature being substituted for it.

The public washhouse as we know it scarcely exists anywhere out of England. In Germany all I could hear of or see were four rather old establishments at Hamburg, Berlin, Augsburg, and Metz.

The general warm water bath of these countries has been, until very recently, that of the ordinary tub or slipper form. These are made of copper, enamelled iron, polished concrete, white tiles, and marble; but very seldom of the glazed earthenware now so largely in use with us. These baths vary in size and shape; and stand above the floor, or are wholly or partially let into it. In every one of these slipper compartments there is almost invariably a warm and cold douche apparatus.

In Berlin, Vienna, and many of the other principal cities and towns of Germany and Austria the use of these slipper baths, in the reorganised public baths, is being largely discontinued in favour of the "rain douche bath," a form of shower bath introduced to notice and strongly advocated, in preference to the former, by Dr. Oscar Lassar, a well-known skin

doctor of Berlin, whose writings upon this question of baths for the poor are not so well known in this country as they should be. Dr. Lassar claims for the "rain douche" that, apart from its lower cost and economy of space, it possesses the following general advantages for the bather himself. Its physiological influence upon the organism is a quickening and refreshing one; at every season it is pleasant and never weakening to spray the well-soaped body with warm water and then to finish off with moderately cool or even cold water. The cleansing is absolutely thorough, and is essentially promoted by the fact that all the dust and dirt with which the water becomes soiled is immediately carried away and continuously replaced by clean water. In the case of the ordinary tub or slipper bath, the bather always finishes up finally in dirty water, more especially the workman, who leaves all the accretions of an entire week in the tub. Moreover, the individual using a public shower bath is better guarded from infection, and from contact with the vestiges of his predecessor than in the tub, as he can himself, without trouble, secure the cleansing of his cubicle by turning the shower nozzle over it. In addition to this, the bath itself calls for but little time or personal service from the attendant in charge, and permits of a greater number of persons bathing quickly one after another without insanitary results. The continuous use of the slipper bath by a large number of bathers rapidly following each other entails much labour and some difficulty to keep clean, requiring the attention of the attendant between each bather's visit. With the "rain bath" little or no attendance is required, whilst the whole principle of the bath is cleaner and less liable to transfer skin complaints than in any other form of bath. It must also be remembered that it presents far less danger of catching cold in comparison with the warm slipper bath, with its relaxing influence upon the vessels of the skin; and that the hardening effect of the bath can scarcely be obtained in a more rational way than through the successive warm and cold ablutions.

These arguments for this new form of bath have been obtained from Lassar's books, and from the officials of bathing establishments in which they are in use; and it must, I think, be admitted that a good case is made out as to their general superiority as quick, cheap, and efficient baths for the poor. A thorough inspection of their working convinced me as to the justice of these claims, which are practically endorsed by the New York Committee before referred to.

In Berlin and many other parts of Germany there are now numerous very small establishments fitted up with this apparatus and no other form of bath. They are arranged in a number of cubicles, arranged for the double purpose of dressing and bathing. Each compartment in its back division is provided with a rain-shower apparatus, which by pulling a lever gives unlimited supply of warm and cold water.

Although the same enthusiasm for this rain bath is shown at Vienna and other Austrian centres, the application of its principle to the plan and arrangements generally is altogether different. Here the three operations of undressing and dressing, hot and cold water douches are provided for in three separate apartments, instead of one double one as in the German examples.

Vienna has already erected eleven of these people's baths, and the erection of several more is contemplated. A similar number of these revised establishments have also been erected, or are in course of erection, in Berlin. Of the two systems of administering these people's baths, that of the Austrian is said to allow, under pressure, of a larger attendance of bathers; as the number of dressing spaces may be from 25 to 33 per cent. greater than the number of bathing cells. The separation of the warm from the cold water compartment enables the attendant to see that each bather properly follows his warm ablution with the cold shower; and, lastly, it is said the separate divisions are more readily kept clean. Its

disadvantage to my mind is that the separation of departments requires the adoption of bathing dresses by every bather, and there is of course less privacy about the system than in the German.

After careful consideration of the two systems I must say that my preference is for the German, as being more suitable to our habits; and I am now arranging its introduction into two new establishments.

I think this somewhat lengthy *résumé* of the principle and practice of these new shower baths requires no apology from me, as I feel that it will be full of suggestions to those of you who may not have seen them working.

On the walls will be found plans of the different forms of these Continental baths, all of which I have visited and carefully examined. They have been transposed into an English scale for their better comprehension, and reproductions of some of them appear on subsequent pages. For the opportunity of making these copies I am indebted to the different city authorities in whose charge the buildings are. I must also acknowledge the great assistance rendered me by the authorities of the German Embassy in London, and especially by Herr Muthesius, in my German trip referred to above.

Having given the principles which should govern the distribution and arrangement of public baths and washhouses, and having compared our practice in these matters with that of Germany and other countries, I now propose to describe the plan and arrangement of each of the three classes of typical establishments in such detail as may be possible in the time remaining at my disposal.

CENTRAL ESTABLISHMENT.

The site for an establishment of this size should have a superficial area of from 30,000 to 40,000 square feet, and, if possible, frontages abutting upon two roads or streets. Its position should be prominent, in a good public thoroughfare, and easily accessible from all parts of the town or parish by omnibus, tram, &c. It should admit of the perfect drainage of all portions of the establishment without necessitating an expensive treatment of levels of the building generally.

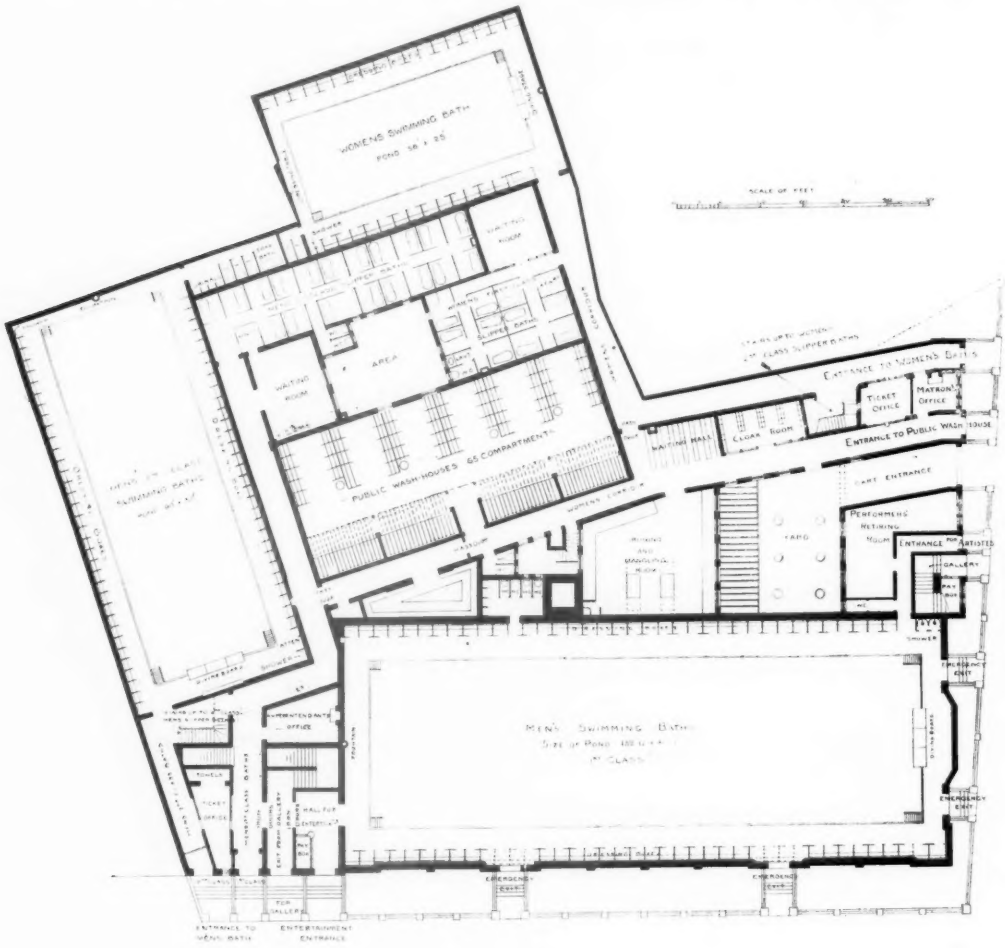
The next point of importance is that there should be an abundant supply of water, and that it should be pure and soft. We all know that soft water is appreciated for its great detergent property, and that hard water, apart from its lack of this quality, acts injuriously when used for either washing or bathing; and, when employed for the generation of steam, forms troublesome and dangerous incrustations in the boilers. For laundry purposes, the use of soft water in lieu of hard effects a very material difference in the cost of soap; in addition to which, the operation of washing itself is far less disagreeable, and the clothes considerably less subject to wear and tear by it.

The supply at command should be sufficient to meet the largest demands at the busiest period of the season, and should include a storage for some fifteen to twenty thousand gallons of water.

One of the largest items of expenditure in the maintenance of these establishments is that for water. Its importance upon the possible financial results of these undertakings will be appreciated when I tell you that the annual water bill of the Hornsey Road Baths is considerably over £1,200. Two wells have now been bored adjoining the Public Washhouse of the establishment, from which, with the necessary machinery, a supply of some twenty thousand gallons of water per hour will be secured, and which will amply suffice to supply the needs of the buildings which are now in course of considerable enlargement. The cost of the water thus obtained, it is confidently expected, will not exceed from thirty-five to forty per cent. of

that from the New River Company's mains. The saving thus effected will convert what has hitherto been a very small deficit into a yearly profit upon the whole undertaking.

In Glasgow and many of the great Continental cities and towns the municipal authorities make no charge for water used for their public baths. It will not, I hope, be too much to



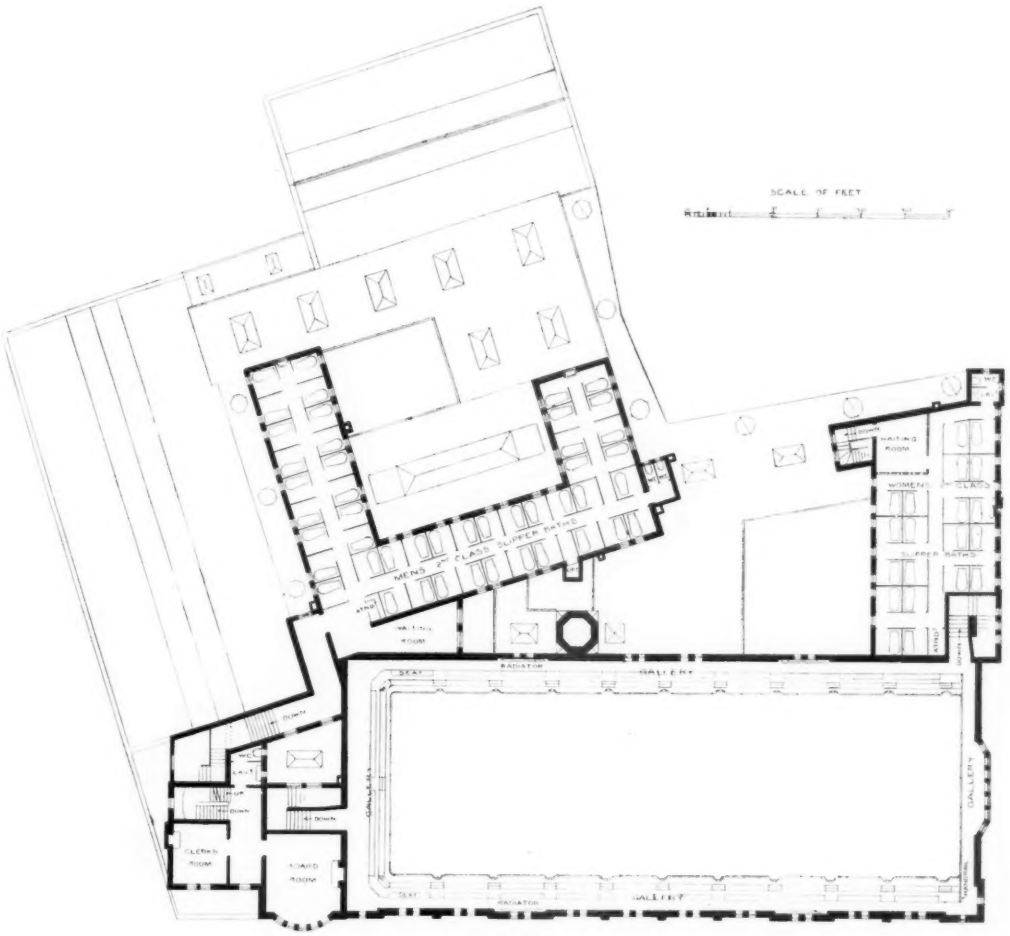
GROUND PLAN

FIG. 2.—PUBLIC BATHS AND WASHHOUSES, KENNINGTON ROAD, S.E. (A. Hessell Tiltman, Architect.)

expect that the London County Council, when they have secured the control of the water supply of the Metropolis, will willingly so supply those of our own establishments.

The difficulty of obtaining sites in positions for these large Central Establishments would be very materially lessened if the promoters would be satisfied with a small frontage towards the main thoroughfare. Subject to this condition, the area of land procurable is practically unlimited, and would carry with it sometimes sufficient frontages to adjoining streets of quite minor importance, but still suitable for an entrance for the delivery of coal, &c. By adapting

the quadrangular system to such a site, I enabled the Baths Committee of the Islington Vestry to secure two most excellent sites at a very considerable saving of time and money. The establishments referred to are those in the Hornsey Road, N., and Tibberton Square, N., plans for which are here reproduced [figs. 4, 5, and 6].



FIRST-FLOOR PLAN.

FIG. 3.—PUBLIC BATHS AND WASHHOUSES, KENNINGTON ROAD, S.E. (A. Hessell Tiltman, Architect.)

In both of these instances a very limited amount of frontage was secured, enough for only one main entrance; but through this, by grouping the various departments round a quadrangular space at the back, I secured their necessary six entrances. So far from such an arrangement being objectionable, it has been found so convenient for working purposes as to render it almost a necessity in establishments fronting on very busy main thoroughfares. In my opinion the application of this principle of arrangement to the site of the Shoreditch Baths would have been simply invaluable for quiet and convenient establishment working, and it is to be regretted that the opportunity of adopting it was lost.

As it is proposed to concentrate all the swimming baths of the district in one or more of these Central Establishments, the new treatment of this, the most remunerative of all departments of public baths, will permit of many improvements in their arrangement and fittings not possible under the present system of administration.

I cannot say that the ponds may be larger, for we have already reached in many of our establishments the limit of size beyond which it would certainly be, in my opinion, very unwise to go. It is only parishes like Lambeth or Islington, with sites like those of the Kennington Road and Hornsey Road respectively, that can expect to provide and maintain ponds of the

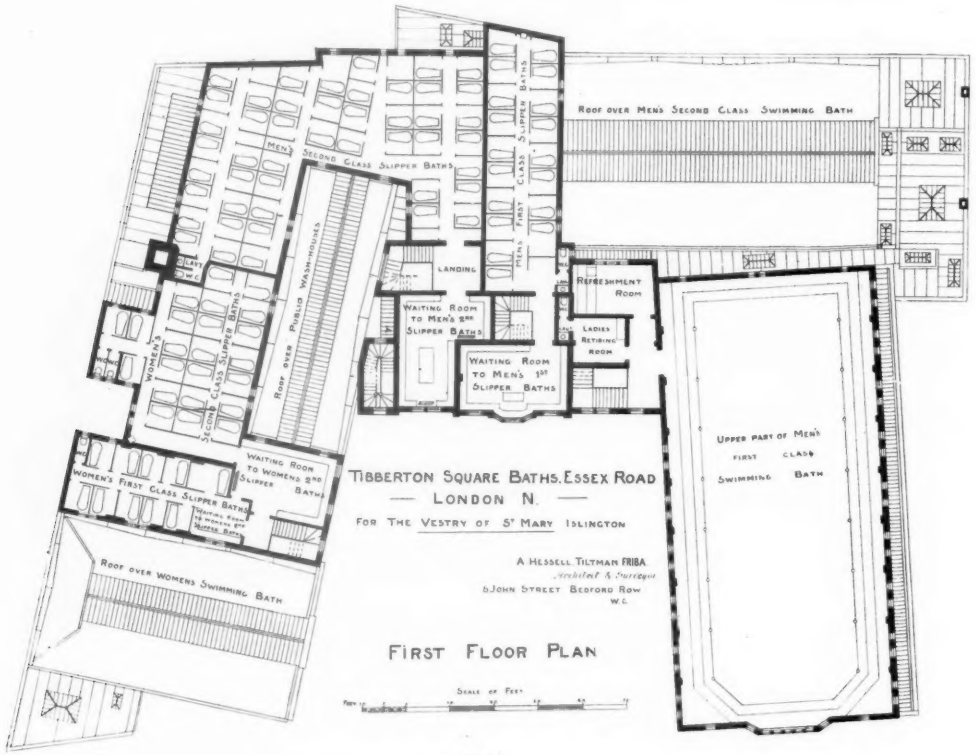

Roof over Men's Second Class Swimming Bath
Men's Second Class Slipper Baths
Men's First Class Slipper Baths
Landing
Refreshment Room
Waiting Room to Men's 2nd Slipper Baths
Waiting Room to Men's 1st Slipper Baths
Ladies Retiring Room
Roof over Public Wash-houses
Women's Second Class Slipper Baths
Waiting Room to Women's 2nd Slipper Baths
Women's First Class Slipper Baths
Roof over Women's Swimming Bath
Upper part of Men's First Class Swimming Bath
Tibberton Square Baths, Essex Road
— London N. —
For the Vestry of St Mary Islington
A. Hessell Tiltman FRIBA.
Architect & Surveyor
6 John Street Bedford Row W.C.
First Floor Plan
Scale of Feet

FIG. 5

dimensions of 132′ 0″ × 40′ 0″ adequately and without waste. The Vestry of Battersea are, however, I believe, building a swimming bath with a pond larger even than this, *i.e.* 150′ 0″ × 50′ 0″, to be used alternately by men and women. I very much fear such a bath will be unwieldy and extravagant in management. A pond of this size holds just upon 250,000 gallons of water, which alone, at 7½*d.* per 1,000 gallons, will cost £7 13*s.* 9*d.* to fill it each time, and will not in all probability be adequately used two months of its season of six.

Personally I deprecate the general adoption of ponds of such large size. It is far better, in my judgment, to increase their number in any establishment, rather than their dimensions when the latter exceeds 90′ 0″ × 30′ 0″. By this means only can the consumption of water and the amount of heating, &c., be adapted in any way to the current attendance of bathers.

A very ordinary and useful number of ponds for one of these Central Establishments will

be five. These will consist of two baths for each of the two sexes, and a fifth or small pond which may be used alternately from either the male or female corridors for several purposes, but which is principally provided as a teaching pond. This latter provision, although common enough abroad, is almost unknown in England. There are two at the Kent Street Establishment, Birmingham; and I know of no other in this country. The pond to this bath should be about 20′ 0″ × 12′ 0″, and it should be specially arranged and fitted up for the private teaching of swimming. From the convenience of its position and its small size it

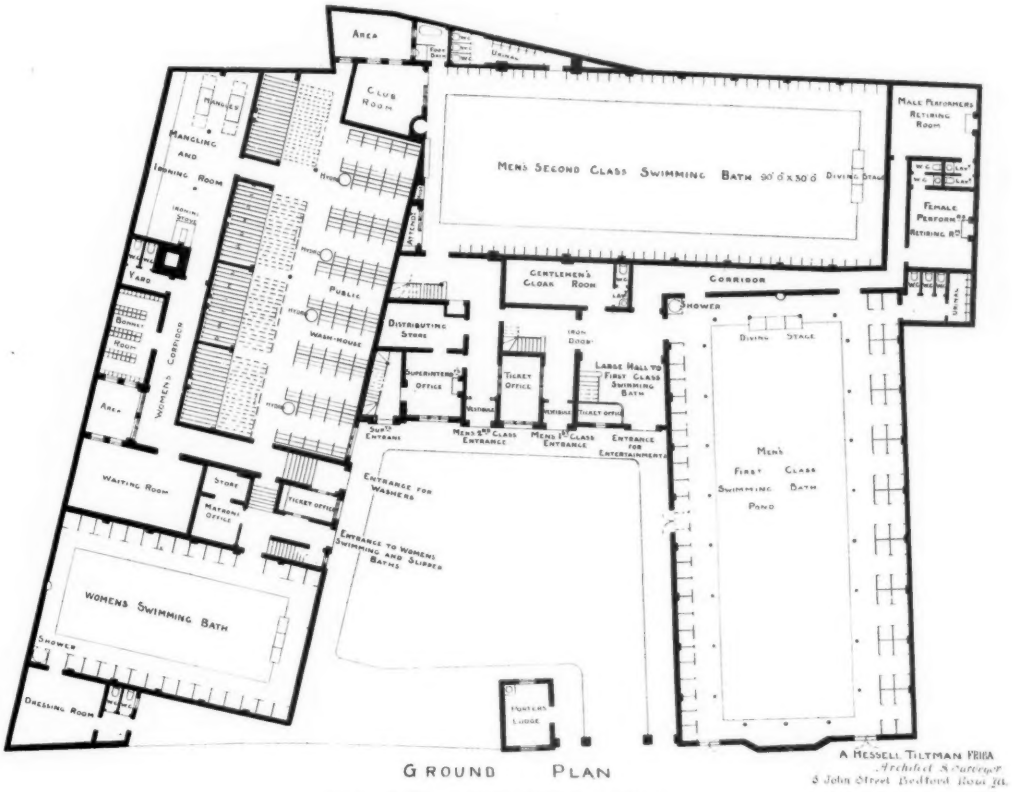


FIG. 6.—TIBBERTON SQUARE BATHS, ESSEX ROAD, N.

will doubtless be found useful for small schools, clubs, &c., when not required for teaching, in which case the bridges and other fittings must be removed.

The dimensions of the ponds of the other four swimming baths are as follows:—

Men's	first class:	100′ 0″ × 35′ 0″.	Depth, 7′ 0″ to 3′ 6″.
,,	second class:	90′ 0″ × 30′ 0″.	,, 6′ 6″ to 3′ 6″.
Women's	first class:	75′ 0″ × 25′ 0″.	,, 6′ 0″ to 3′ 6″.
,,	second class:	50′ 0″ × 20′ 0″.	,, 6′ 0″ to 3′ 6″.

It is the general practice in England to close the swimming baths during six months of the year, with the exception of the smallest one. I, however, cannot but think this is to be regretted, as the pleasure and benefit of swimming could very well be maintained throughout

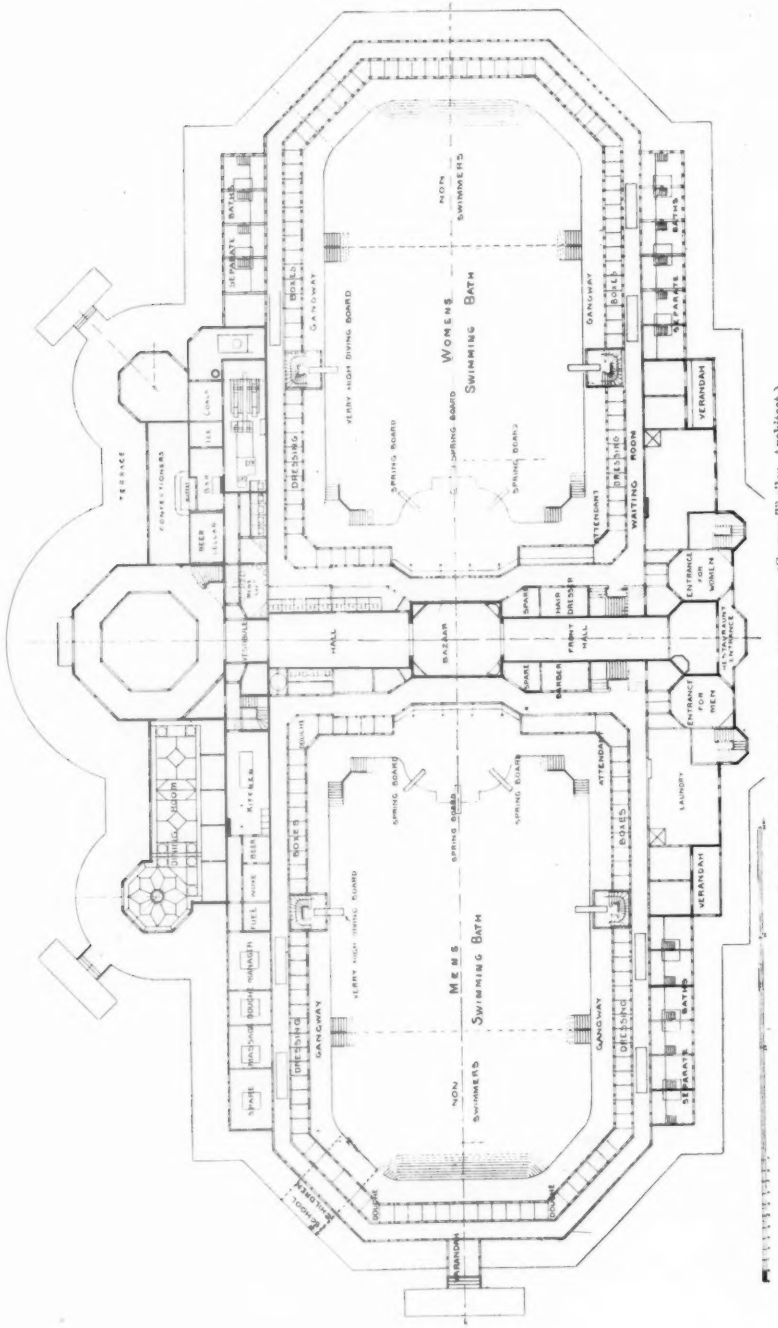
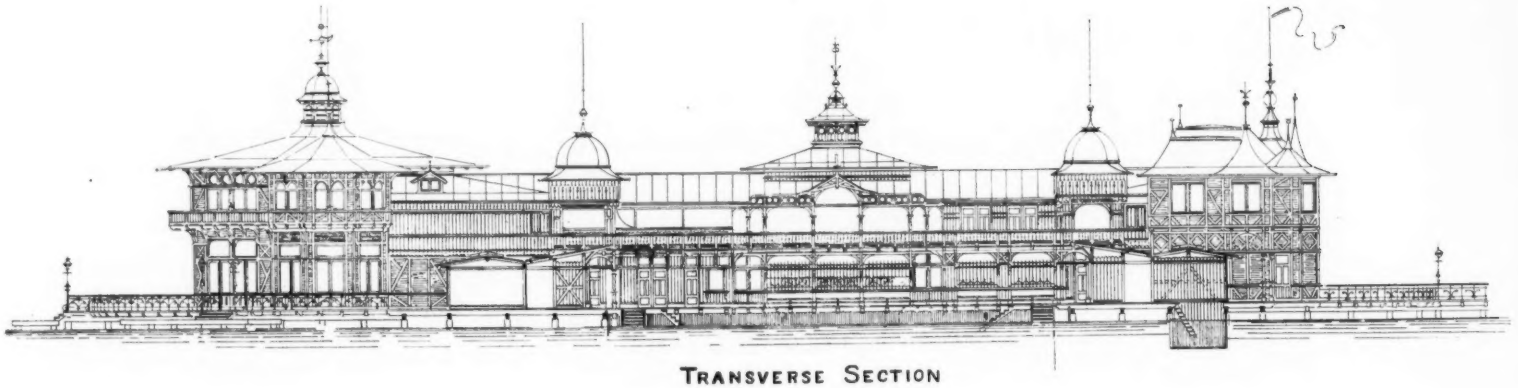
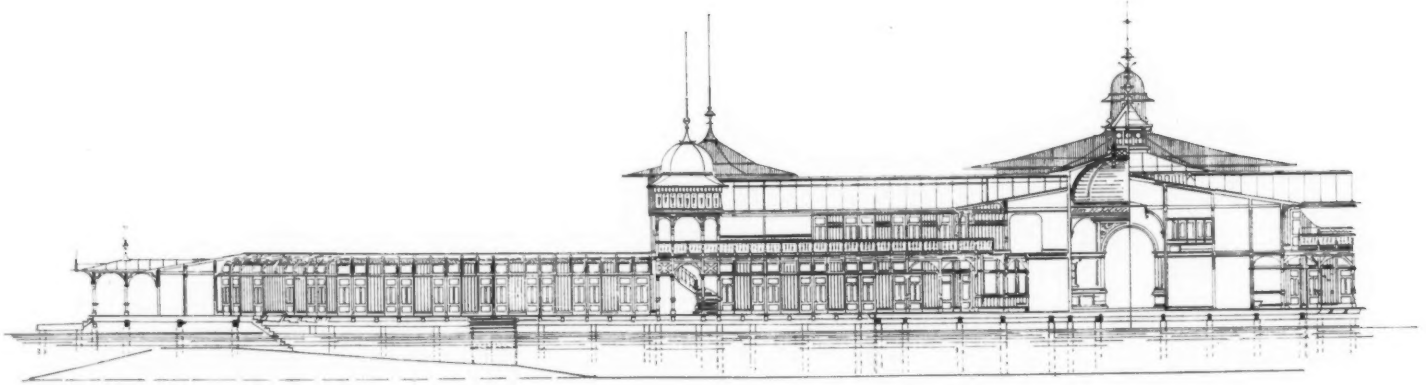


FIG. 7.—RIVER BATHS ON THE ALSTER, HAMBURG. (George Thielen, Architect.)



TRANSVERSE SECTION



LONGITUDINAL SECTION

FIG. 8.—RIVER BATHS ON THE ALSTER, HAMBURG. (George Theilen, Architect.)

the year were we not so wedded to the large-size ponds, and if only the warming and other arrangements were more adequate for their purposes. Germany, with a much colder climate, keeps open its swimming ponds throughout the year; but to do this in this country would necessitate several changes of a structural character, and these being made, the various swimming clubs would gladly use them throughout the winter months.

We must still, I think, presume that one of the series of swimming baths will still, for the present at any rate, be let during the winter months for public entertainment purposes. Whether this be the men's first-class swimming bath (as is usually the case) or any other, it would naturally have the first choice of position upon the site. Should the proposed establishment be in London, the plan in all its details must be very carefully adapted to meet the County Council requirements for public safety before the necessary Music and Dancing Licence can be obtained. The best way to secure this latter is probably to see that two sides of this bath abut on two roads or streets; thus securing the means of ample and direct exits. It must be so arranged, together with its rooms for artistes, cloaks, latrines, &c., that it may be entirely shut off on occasions of such entertainments from the remainder of the establishment.

The now well-understood principles of public safety universally applied to theatres and concert-halls are necessarily and equally applicable to such portions of these bathing establishments as are used for similar purposes. Although these requirements of the London County Council increase somewhat the initial structural cost of the building, still they cannot be said otherwise to be unduly onerous or troublesome. Beyond saying that these requirements deal with the mode of general construction employed, the seating, entrances and exits, the warming and lighting, all as affecting the prevention of fire and panic, I do not propose to deal further with them.

Having thus disposed of the position of our chief department, the remainder of the establishment accommodation has to be arranged in such a manner that all departments may be conveniently attended to at their respective entrances, by not more than two ticket offices. Of these, one of course would be for men, and the other for women; and probably the further each is from the other, the better. After this necessary point of administrative convenience and economy has been attended to, due regard should then be had to the general official communication between all departments, together with their lighting and ventilation.

Although it would undoubtedly simplify and economise the engineering installation, I am not at all sure that there is any objection to placing the purely ablutionary baths upon the first floor. Having regard to the frequently costly nature of these sites, the extra space thereby secured, to say nothing of the advantage to the exterior architectural grouping, I prefer to distribute the baths between the ground and first floors, and, if proper lighting can be obtained, the basement as well. Several of the recently erected Metropolitan establishments have, in my opinion, lost a good proportion of their possible accommodation, and been moreover less conveniently arranged, by the unnecessary persistence in keeping all the slipper-bath accommodation upon one floor.

I have in several of my largest establishments in London placed the greater proportion of the slipper baths upon the first floor, and no inconvenience has resulted therefrom. The arrangement has certainly the advantage of securing more quietude than might be possible in the immediate neighbourhood of a noisy swimming bath. Where slipper baths are so placed, it will of course be understood that they should be for the whole of one or more classes of bathers; and that there must be no subdivision of a single class between two floors. The supply and waste pipes to and from these baths should be carried in small accessible channels in the floor, or with proper precautions they may be suspended from the ceilings immediately underneath and entirely in view. So arranged, they are not necessarily disfiguring in

appearance, nor inconvenient in arrangement; whilst the structural subways for their reception between the two storeys, sometimes advocated, would be most extravagant in cost and objectionable in use.

The hot-air baths, in two classes for men and one for women, are probably best accommodated upon the ground floor.

The establishment laundry here I have suggested should be arranged to do its own towel washing and that of all the Branch Establishments, and is most conveniently arranged on the ground floor, or, failing this, in the basement, providing proper access to and from the court-yard is secured.

A thoroughly well lighted and ventilated boiler-house and engine-room should be provided in the basement, with access for the delivery of coal, &c.

The superintendent and engineer and their respective families may have their separate sets of apartments upon convenient points of the second floor.

A refreshment room is a very desirable accompaniment to a bathing establishment, but a very difficult provision to locate satisfactorily.

Having given the primary motives governing the arrangement of this establishment, I will now deal with the details affecting its several departments.

SWIMMING BATHS.

As a very rough rule, it is assumed in Germany that there should be a swimming bath for every 25,000 inhabitants, and that of this number about two per cent. bathe in them daily. As nearly as I can ascertain, the proportion of persons using the swimming baths in England is about $3\frac{1}{4}$ per cent. It is found that swimmers upon an average bathe once in every four days throughout the season, and that the proportion of male to female bathers is at present 10 to 1. The proportion of the first-class to the second-class men bathers varies from 2 to 1 to about an equal proportion, according to the character of the district.

The foregoing figures must be taken as a very rough approximation to general working data, but they will be doubtless some guide in deciding what the collective accommodation of swimming ponds shall be for a given district, and in proportioning their individual dimensions. What is now very much wanted is a good working unit of pond surface per bather. I have made many inquiries during the last four or five years throughout our own and other countries among swimming masters and bath superintendents, and so far I have obtained no satisfactory answer.

Men's First-class Swimming Bath.—The men's first-class swimming bath is here presumed to be arranged so as to be adaptable for entertainments during the winter. At its chief entrance it has an entrance hall, cloak room for gentlemen and ladies, and at the opposite end the necessary performers' retiring rooms, which are ordinarily in the summer months converted into one large room and used thus as a club and dressing-room by members of swimming clubs using the bath.

The hall usually consists of two storeys—that is, a ground floor with a gallery over. The floor of this latter should be constructed of steel and coke-breeze concrete, and its upper surface should be stepped so that at least three rows of spectators (two seated and one standing) may see the surface of the pond during a swimming contest.

One fault to be found in most of our swimming baths is the insufficiency of the dressing-box accommodation in proportion to the superficial area of pond surface. No consideration appears to be given by architects to this necessary relation between the number of dressing places and the area of the pond; and indeed oftentimes an unnecessary liberality in the

dimensions of the boxes adopted has the effect of still further accentuating this blunder. The almost universal arrangement of placing our dressing boxes down two sides, and possibly one end of the hall, must be improved upon if it is desired to correct this defect. There are two ways of doing this: first, the Continental method of placing an equal proportion of the dressing boxes or places upon the gallery floor; and secondly, to arrange them in a series of transeptal bays upon one or both sides of the bath.

I confess to having a strong objection to placing dressing boxes upon the gallery floor, as it entails a direct communication between the two floor levels, which arrangement, at all events, would not be permitted by the County Council under their Music and Dancing Licence. There is also a risk of some accident to young bathers in their running up and down such staircases with wet feet. Examples of this arrangement will be found on reference to the gallery-floor plans of the new baths at Stuttgart and Frankfort, and other of the German baths, of which plans are shown upon the walls.

The second arrangement—viz. the dressing boxes arranged in bays—can hardly be said to have been properly tried anywhere. I have adopted it in a tentative manner in two of my establishments in order to overcome the difficulties of a restricted site, with the result that I recognise it as one way of obviating the difficulty of the scarcity of dressing boxes.

I have already alluded to the "back-corridor" arrangement of dressing boxes in use in Germany and other parts of the Continent. This system was adopted in England with many of the first sets of swimming baths, but, as the arrangement has been practically abandoned everywhere, it is unnecessary for me to say more about it.

The pond should be rectangular in shape, and in the proportion generally of length to width as 3 to 1. Its internal angles should not be rounded, and the whole surface of the water must be free from all permanent projections or obstructions, so that in swimming races every competitor has equal opportunities as to space, &c.; all steps therefore for access to the water should be of wood, and made removable. One or two sets of these are provided at each end, fixed generally to the safety rail or by other equally convenient means. An open self-draining channel, close to the top of the pond and running continuously round it, serves as a scum overflow and spitting trough; and a suitable height above the water line, an iron or copper safety rail $1\frac{1}{2}$ inch in diameter should be run all round the pond for the use of tired swimmers. At the shallow end, a portion of this pipe is usually converted into a spray pipe, extending the whole width of the pond. By raising or depressing the direction of the perforations in this, a very useful and pleasant means of freshening and clearing the top surface of the water may be obtained.

The depth of water usually adopted in this country is 3′ 6″ at the shallow end, sloping down in one line to a depth of 6′ 0″ to 7′ 0″ at the deepest point; and considering the heavy burden the cost of water and its warming is to the authorities, these depths should be considered sufficient for all practical purposes.

The Continental ponds have frequently much greater depth, as, commencing at the shallow end at about 3 feet, and sloping gently to a point at about one-third or a half the length of the pond, the inclination then changes into a much steeper gradient in order to reach a maximum depth of anything from 8′ 0″ to 12′ 0″. When this practice, however, is adopted, a rope has to be stretched transversely across the pond at the junction for the safety of the non-swimmer.

At every foot of difference in the depth of the water throughout the whole length of the pond, there should be indelibly indicated upon the wall just above the safety rail, in plain figures, the depth of the water. Remember that the level of the overflow is not the general level of the water by some two or three inches, and allow accordingly.

The gangways round the pond should be at least 4′ 0″ in the clear width at the sides, and from 6′ 0″ to 8′ 0″ at the ends. The material for the flooring of this gangway is of great importance. I have myself tried, I think, every possible material, including wood; but there is nothing so good to my mind for a paving in this position, and for non-slipping quality, as a well-rubbed, hard, fine-grained York stone. In appearance the colour is not very decorative; but where something better than this is desired, there are one or two good-coloured mosaic pavements which are not slippery, and which may be safely used.

The gangways should have quick self-draining falls towards a form of surface channel that shall not injure the bathers' feet.

FIG. 9.—MEN'S SECOND-CLASS SWIMMING BATH, KENNINGTON ROAD BATHS.

Some of the Continental ponds have an ornamental railing down the entire length of the two sides close to the edge of the curb, so that no bather can enter the pond except from either the shallow or deep end, and in many instances, either as a part of this railing or independently, there is an arrangement for suspending bathers learning to swim. Both of these ideas are good and might very well be adopted by us.

It is as well to remember, perhaps, that the space required in the pond for water polo is from 75′ 0″ × 35′ 0″, and the depth from 4′ 6″ to 7′ 0″.

The temperature of water in the ponds should be for men from 70° to 72° Fahr., and for women and children 72° to 75°. That of the room outside of the pond, and including the douche room, should never be less than 68°, and for women and children it should equal that of the pond.

If the dressing boxes are to be accommodated in the ordinary manner—that is, down

each side of the bath—3′ 6″ × 3′ 6″ is ample room, and any greater size simply increases the difficulty already referred to. In the event of the hall being used for entertainments, these dressing boxes should either be made removable, collapsible, or, what is simpler and preferable, left fixed with the openings over their doors securely closed by suitable shutters.

The fittings required for the boxes are—a seat, footboard, brush and comb shelf, and two coat and hat pegs. In some arrangements, where larger and better lighted boxes can be secured, the addition of a mirror combined with the brush shelf, with a small lock-up drawer under, is to be recommended. There is always a certain amount of theft taking place in the dressing boxes of public swimming baths, and many efforts have been made to stop the practice. Mr. Grahame Plumber, the Superintendent of the Hornsey Road Baths, has lately devised a system of insurance by which, if valuables are left in a certain manner in the ticket office, any loss then occurring is made good by the company covering the insurance. I have seen many devices both in this country and abroad, but none perfectly satisfactory.

An attendant's box should be provided, and adjoining it a room for hanging up and storing in lockers the bathing dress of bathers possessing season tickets.

Among the fittings required for the swimming bath are the diving stage, judges' platform, press gallery, water chute, for all of which you can do nothing better than adopt the patented arrangements of Professor Newman, the superintendent and swimming instructor of the Westminster Baths.

Douche or Cleansing Room.—As you know, this room and its special appliances do not exist in the swimming baths of this country. We have usually, it is true, a cold shower apparatus or two placed among our dressing boxes, but this is very poor comfort as compared with the agreeably warmed apartment which should be provided at one end of the swimming bath, with proper warm and cold douches. I have already mentioned that this is a universal provision of the German baths, as you will see by examining such of the plans of their buildings as I have here. In all these you will observe that this cleansing douche room is treated as a most important auxiliary to the swimming pond. The reason for this prominence is, of course, the necessity for all bathers using its appliances before entering the pond. Every bather in Germany and Austria certainly observes this rule as a matter of most ordinary necessary routine. The argument used for the universal adoption of this practice is that the bather, without any reference to his position in life or his habits, before entering the swimming pond should, out of consideration for his fellow bathers, undergo a thorough cleansing process. I think that both for sanitary and economical reasons it is greatly to be desired that this salutary practice should be adopted in our bathing institutions.

I think there can be very little doubt that the enforced combination of a thorough ablution with the swimming bath would greatly increase the benefit and pleasure derivable from both baths. I regard, therefore, the swimming bath itself, apart from its recreative value, as one of the best means of encouraging the bathing habit amongst the very poor.

I attach so much importance to the introduction of this feature that I am providing this room for several new establishments upon the plans of which I am now engaged.

The general fittings of this room should consist of some six to ten warm, and two to four cold douches; together with a series of four to six porcelain foot-baths.

The club and dressing rooms should adjoin the deep end of the pond, with a wide lounging corridor between them and the bath. The latrines, I need hardly say, should be cut off from the bath as much as possible, and be separately warmed and ventilated.

Should this bath be let for entertainment, it would be necessary to floor over the pond level with the gangways. The only point necessary to remember here is so to construct the trusses supporting this floor, and the flooring itself, as to be readily portable and capable of easy erection and taking down. The framing, &c., to this floor will also require a large amount of dry storing space.

Second-class Swimming Bath.—The difference in the character and class of bathers in this department from those using the first-class bath, calls for certain changes in its fittings. The chief point is that it is very necessary to do away with the wood dressing boxes. In my own practice I substitute for them open boxes, with divisions and backs of slate or glazed bricks, wood only being used in the footboard, seat, and the latticed framed hopper for clothes; all of which should be readily removable. So arranged it is quite practicable to remove temporarily the wood fittings, and clean out with hose and water the whole of the dressing places. Objection is sometimes taken to the absence of doors to these dressing places, and at one of my recently enlarged establishments I was required to provide them out of regard for a supposed sense of decency; but I think those concerned in the management are disposed to doubt their necessity now they have been in use for a season.

Fig. 9, p. 185, is an interior view of the second-class men's swimming baths at Kennington Road, showing open dressing places fitted in this manner.

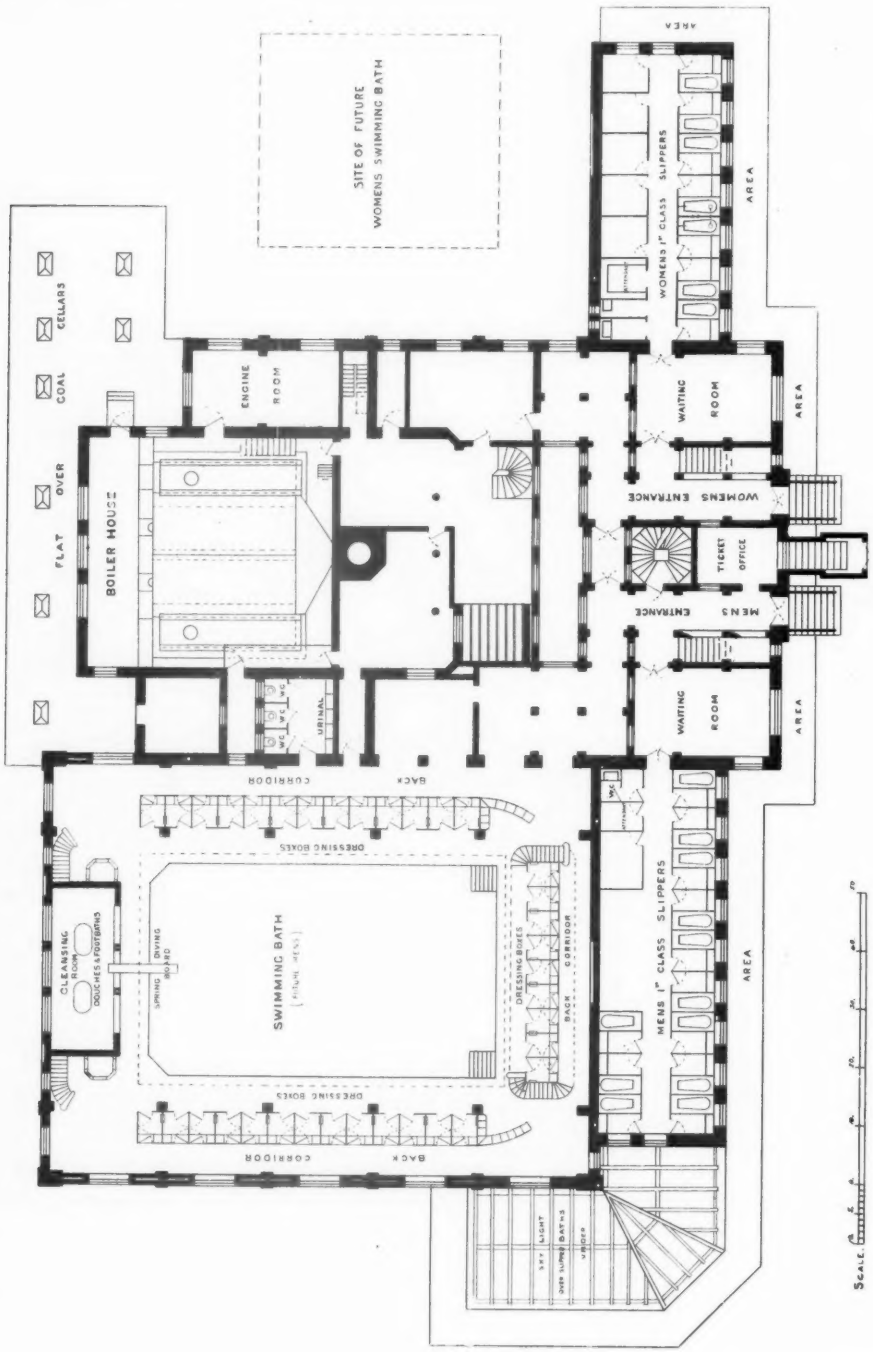
It is not usual to provide a gallery, club or dressing rooms to this bath; but otherwise the appointments are all very much the same as in the first-class bath, less decorative of course, and, if possible, more durable in character.

Ladies' First-class Swimming Bath.—It is desirable here to have dressing boxes of good size, not less than 4′ 0″ × 4′ 0″; and they might very well be provided in a large room separate from the bath. It is desirable to have one or two small rooms adjoining the bath, which may be used either as club or hairdressing rooms. A gallery at one end of the bath is desirable for spectators to watch their children or friends bathing, as it is never desirable to have non-bathing visitors upon the gangways.

Women's Second-class Bath.—The ordinary dressing-box arrangement is here perhaps the best, and with the exception that the club or dressing rooms may be omitted, the arrangements and appointments call for no further description.

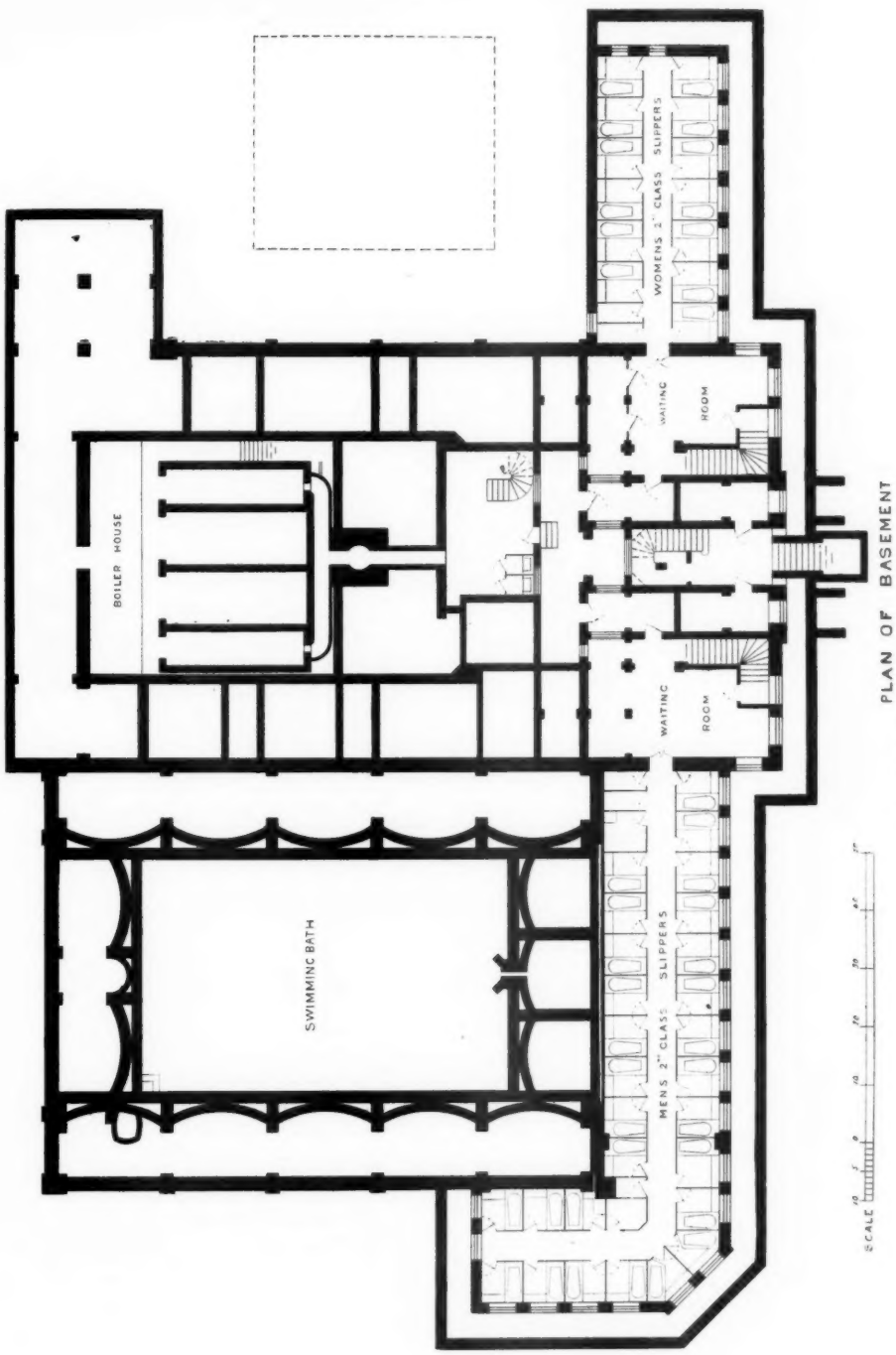
It may be said here that it is very unusual to have two separate baths for the female sex, and so far it has been so. There are signs everywhere that the proportion of women and girls using the swimming pond is daily increasing, partly no doubt due to the encouragement of swimming at the Board Schools. The old practice, therefore, of making the two classes of this sex use the same bath is found so extremely inconvenient that I have had recently to provide the additional swimming bath in several of my establishments.

With the special interest now taken by the School Boards of London and the provinces in the teaching and practice of their scholars in the art of swimming, a very great increase of attendance has occurred at all of our public swimming baths, which threatens partially to dislocate the proper work of the establishment. Whilst no one can welcome more than I do the impetus thus given to the cultivation of the bathing habit, I confess I think that some of the necessary swimming accommodation for this purpose should be provided in some of the school buildings; and I am glad to say that the London and some few of the most important provincial School Boards are providing these baths in some of their schools. Those, however, so far erected that I have seen are in very many of their arrangements and fittings very defective. The warm douche bath preliminary to the use of the pond, advocated in this Paper, is perhaps even more desirable in schools than anywhere else.



GROUND FLOOR PLAN

FIG. 10.—CITY PUBLIC BATHS, HAMBURG.



PLAN OF BASEMENT

FIG. 11.—CITY PUBLIC BATHS, HAMBURG.

SLIPPER AND RAIN DOUCHE BATHS.

These represent the warm and cold water baths of the establishment, and may be accommodated on either ground and first floor or basement.

The First-class Slippers should consist of two compartments, the inner one containing a glazed fireclay bath, white inside and out, the fittings being footboard, towel rail, electric bell and soap dish. The other compartment serves as a small dressing room, and should contain a dressing table and glass, chair, rug, and hat and coat pegs. Each of these baths would have over it a warm and cold douche apparatus. These two-compartment baths are provided in some of the Birmingham establishments, and are very popular.

The Second-class Baths would be fully equal in price and fitting to our present first-class slippers. These consist of a single compartment, the smallest size of which should be 6′ 3″ by 6′ 0″ in the clear. It should contain a glazed fireclay bath as before, but glazed inside and over the roll rim only, the remainder being painted. The additional fittings would be footboard, seat, towel rail, clothes pegs, electric bell, soap dish, combined mirror and brush shelf, and a thermometer.

In both classes the bath should stand free of the wall and floor to permit of ready flushing with water. The divisions may be of enamelled slate, light-coloured marbles, or preferably of white glazed bricks. The height of these divisions should be 6′ 6″, and they should stand some few inches above the floor.

For a small number of baths, the central passage with a row of compartments on each side is best; but where there is a large number it is more economical and better for supervision to arrange them in bays.

The valves to the hot and cold supplies to these baths should be non-concussive, and should be capable of being regulated by the attendant either from the inside or outside of the compartment. The waste should be of such capacity as to permit of the emptying of the bath in two minutes.

Third-class Baths.—To cope properly with the duty of providing the cheapest possible cleansing facilities for the very poor, there is but one way, and that is by the adoption of a warm bath, for which, including soap and the use of towel, a charge of only one penny will be made. I have elsewhere stated that the "Rain Douche Bath" to my mind presents the simplest, cheapest, and, so far as space, water, and time are concerned, the most economical means of effecting this duty. The baths under this class may be entirely douche baths of the type which I have already described.

On one of the drawings upon the wall will be seen the details of a compartment arranged in the Berlin manner.

HOT-AIR BATHS.

These should be provided in my opinion in two classes, the second being, if possible, interchangeable on certain evenings for the use of both men and women.

First-class Bath.—This should be practically both in arrangement and practice upon the lines of the improved form of the Turkish bath now practised in this country. Mr. Metcalfe, a well-known exponent of the Anglicised Turkish bath, speaks of it as "one of pure air, properly heated, having its due proportion of oxygen; making respiration pleasant; oxidation of the blood perfect; evaporation and depuration complete; and exalting the tonic influence of the subsequent cold appliances." There should be three hot rooms—viz. the Tepidarium, temperature 140° Fahr.; the Calidarium, 180°; and the Laconicum, 250°, together

with a combined cooling and dressing room, and a shampooing and douche room. In Continental examples, in lieu of the third hot room, it is the common practice to have a Russian bath or vapour room. This bath is not popular in England. It is worked in common with the hot-air rooms from the same cooling, dressing, and shampooing rooms. The combined cooling and dressing room should be a large, light, and airy room divided into bays or divisions 12′ 0″ by 12′ 0″, containing space for four couches. In the Bremen Public Baths there are two sets or classes of cooling and dressing rooms to one set of hot rooms. With the improvement of one of these being divided into compartments, and the other free from them, the arrangement appears worthy of adoption here. The shampooing and douche room has the usual benches, wall basins, douches, sitz bath, &c., and the plunge bath (about 20′ 0″ by 7′ 0″, 3′ 6″ to 4′ 6″ depth) is usually adjacent to it, and *en route* to the cooling room.

Second-class Hot-air Baths.—For these I recommend a system of public baths suggested by Metcalfe in his book, *Sanitas Sanitatum et Omnia Sanitas*, which consists of a combination of hot-air rooms of the Turkish bath, with a system of warmed lavatories in lieu of the shampooing process and plunge bath. It is suggested that, although the shampooing process is an operation of great sanitary value, the ordinary member of our working classes, who does not suffer usually from too little work and too much food, does not require this corrective; and that this modification of the Turkish bath, therefore, for all ordinary purposes of ablution would be perfectly effective, less provocative of colds, and more economical than the ordinary warm slipper bath. Although this form of bath has not been tried at all, I think it is a form of hot-air bath extremely suitable for the second-class division of the hot air baths of the Central Establishments, and for this reason I recommend some of the promoters of our future establishments to give it fair trial. In Vienna, it should be mentioned, no shampooing is given in the hot-air baths unless specially asked and paid for.

The hot rooms should be so arranged and constructed that their walls may be exposed as little as possible to any cooling influences. For this reason their internal walls, floors, and ceilings should be separated by a cavity, and finished internally with such materials as will not be affected by high temperature (and in the Russian bath by steam); and moreover should be capable of being constantly cleaned down with water.

The walls and ceilings are best lined with glazed bricks, the ceiling being arched or vaulted. The floors should be of York stone, or mosaic as described, to the gangways of the swimming baths. If these rooms are under any other rooms, the floor above should be fire-resisting and heat-proof. It is a moot question abroad whether there should be fixed benches, or suitable chairs, movable benches and tables. In most of the Continental establishments, where fixed benches are used, their tops are generally of white marble 2′ 0″ wide with the risers of glazed bricks.

The heating of this bath may be effected by steam, as in many of the Continental examples, or, what is more common with us, by its own independent furnace.

In concluding my remarks upon this department, I would like to draw your attention to the hot-air and vapour baths shown upon the plans of the baths at Frankfort, Stuttgart, the Admiralgarten Baths at Berlin, and others.

THE ESTABLISHMENT WORKING DEPARTMENT.

The most convenient position for this is on the ground floor, but, failing this, it may be located in the basement of the establishment; but care should be taken in that case that good lighting and ventilation are secured for it. In the frequently very costly and restricted sites available in London for these large establishments, this is a matter of extreme difficulty.

The following are the various rooms &c. required :—

Boiler house, with coal storage; engine room; accumulator room; receiving room; washhouse; drying room; folding and distributing store rooms; mess room; engineers' workshop.

Boiler House.—The usual and probably the best means of heating the water in the ponds is by the injection of steam combined with circulation. To carry out this system properly, and for the production of steam and hot water for the requirements of the establishment generally, the services of three large steel boilers of the Lancashire type, adapted to a working pressure of at least 100 lbs. per square inch, will probably be required. It is usual to make each of these boilers interchangeable for either steam or hot water.

In comparison with the foreign boiler houses, our own present, frequently, a very rough and untidy appearance. The boiler house should be well planned, with good lighting and ventilation, and care should be taken to avoid such an involved system of pipes and fittings as we so often see. The openings to the coal bunkers (which preferably should be in front of the boilers) should have some convenient form of iron sliding doors so as to keep the house free from dust when coal is being delivered.

Engine Room.—This should have a horizontal engine of sufficient power to drive the laundry and other machines. In the same room, or preferably one closely adjoining, it will be convenient to place the high-speed steam engine and dynamo for the generation of the current for the lighting of the building, together with the main switchboard. Should there be an Artesian well, then a room should be provided for the pumps, &c.

Accumulator Room.—This may conveniently adjoin the electrical engine room; its arrangement and size depend upon the form of the batteries and their capacity.

Receiving Room.—This is the room to which all the dirty linen of this and the other establishments of the district would be conveyed. It should be conveniently arranged so as to be easy of access from the courtyard, and, if in the basement, the dirty linen should be passed down a shoot arranged for the purpose.

Washhouse.—This would be arranged to take the necessary washing machines, rinsing and boiling tanks, and hydro-extractors, driven where necessary by overhead shafting and belting. All these appliances would require to be adapted in capacity and number, according to the amount of work required to be done. Care should be taken to arrange the various machines &c. in the ordinary sequence of the washing process, by which means time and labour are saved.

Drying Room.—The ordinary system of steam-heated drying closet combined with blast apparatus is perhaps as good for this purpose as any other. The horses may be of the usual draw-out character, and should be from thirty to fifty in number. In the foreign examples, these drying horses are constructed entirely of hard wood, and are of course much more easily moved, and they appear to be perfectly durable.

In some of the Metropolitan establishments this operation of drying is very effectively and quickly done by the towels &c. being passed through a steam-ironer.

Folding and Distributing Store Room.—The towels &c. are brought to this room after leaving the drying closet, mangled in the box mangles, or passed through a steam ironer, folded and deposited in the adjoining distributing linen store, from which they are given out to this or the branch establishments.

Mess Room.—This should be a comfortable room for the use of the men working in the basements. It should have a small cooking stove, and a supply of lockers to take food &c.

Engineers' Workshop.—This requires to be a well-lighted room with a steam-driven

screw-cutting lathe, a steam-drilling machine, a carpenter's bench, a smith's forge, anvil, and a grindstone. A store should adjoin it for material, tools, &c.

VENTILATION.—I have said nothing hitherto about the general warming and ventilation.

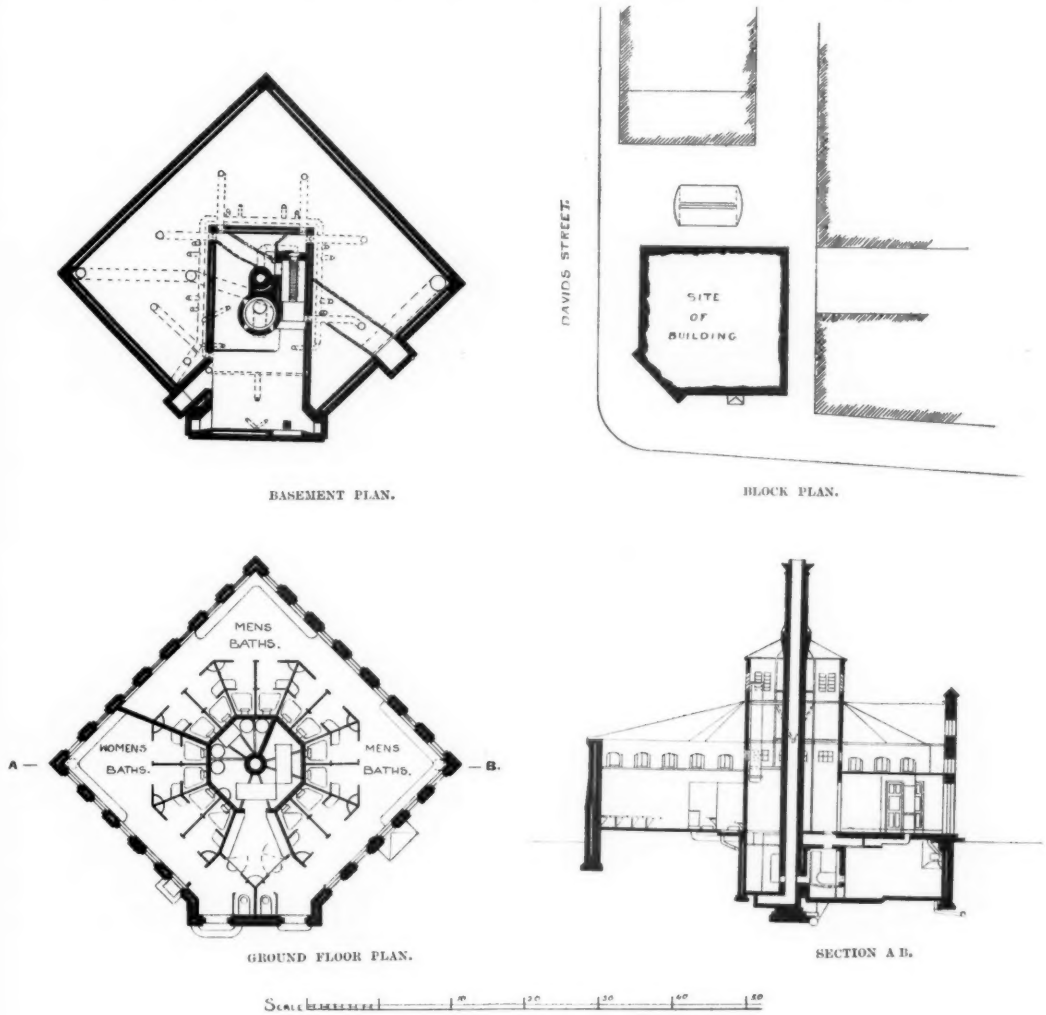


FIG. 12.—PEOPLE'S BATHS AT ST. PAUL'S, HAMBURG.

These questions, together with that of the engineering generally, would take a whole evening alone to discuss. I will only remark that they deserve much greater attention than they generally obtain with us. With reference to ventilation, it is not enough to rely entirely on natural means; these bathing establishments require the very best mechanical means of frequently changing the air in a regular manner, applied to nearly every part of the buildings.

Upon the Continent a well-devised scheme of ventilation combined with warming is arranged with the initial planning of the building.

Administrative Department.—The following offices will be required for the transaction of the business of this and the various Branch Establishments: Committee room, with cloak room, lavatory, &c.; clerks' office; superintendent's office, ground floor; suitable apartments respectively for the superintendent and the engineer, with separate entrances to them.

I have, I regret to say, been prevented by pressure of work from preparing plans of this typical Central Establishment.

BRANCH ESTABLISHMENTS.

It will be remembered that the primary motive of these Branch Establishments is that the chief proportion of the ablutionary baths for the poor, and the whole of the public washhouse facilities, should be accommodated in much smaller buildings, erected at much more frequent intervals throughout the poor and populous neighbourhoods; and that I have divided these Branch Establishments into two types and sizes of establishments, calling the first "A" (Baths and Washhouses), and the second "B" (People's Baths). Typical plans of both are given. These, although but little more than sketches, will serve to sufficiently illustrate my suggestions.

TYPE "A" (BATHS AND WASHHOUSES).

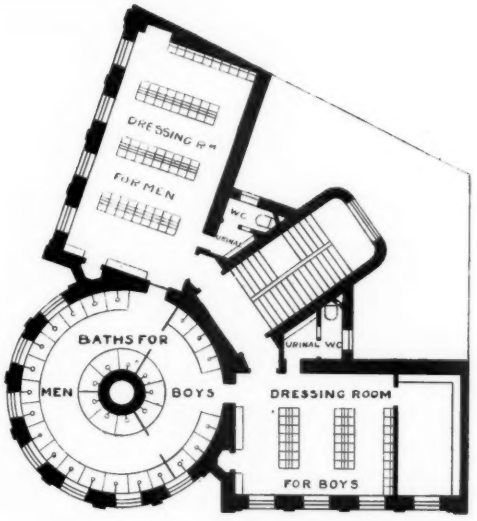
This, the larger of my Branch Establishments, is capable of being accommodated on the site of four small houses, and preferably a corner one. Those on the plans are respectively 80′ 0″ by 80′ 0″, and 80′ 0″ by 42′ 0″. In both sets the establishment accommodates on the ground floor the public washhouse, and on the first and second the slipper and rain-douche baths. The basement readily in this case accommodates the boilers.

PUBLIC WASHHOUSE.

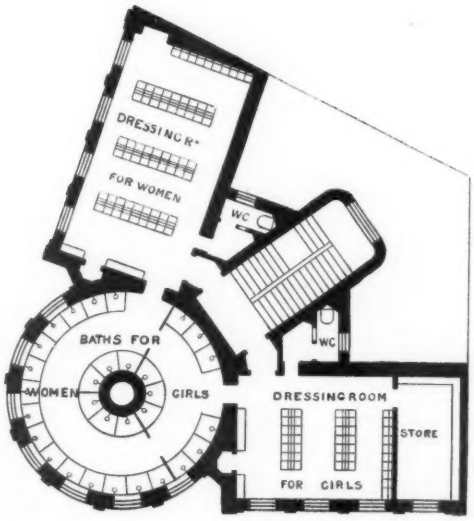
The present arrangement of the public washhouse in all its details requires overhauling; and in describing the small installation here, the direction of some of these will be indicated.

The accommodation in both sets of plans is strictly limited to compartments for from twenty-eight to thirty-seven washers, the whole of which is contained on the ground floor. The following rooms are required and shown:—Washhouse, mangling room, waiting hall, cloak and bonnet room, crèche, ticket office.

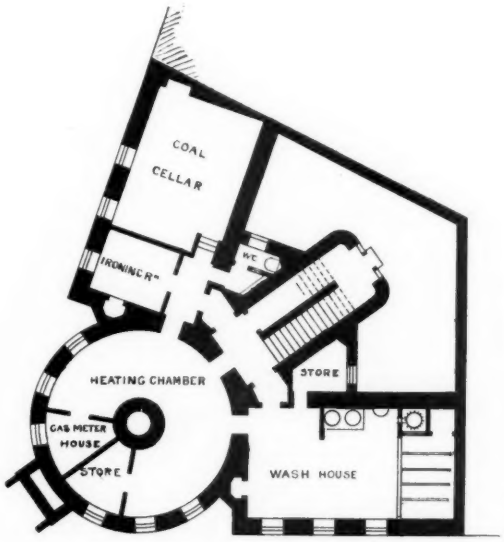
Washhouse.—In order to plan this apartment properly, we must first of all decide what arrangement of drying closet shall be adopted. The common and in England the invariable practice is to collect the drying horses into one or more steam-heated closets down one side of the room, with the washing compartments arranged on the other side of it. Each washer has the sole use of a washing compartment and one drying horse, both numbered to correspond. The compartments are usually ranged back to back, preferably down both sides of a short bay, and opening at the drying closet end on to a good wide main passage or gangway. This arrangement, whilst it minimises passage space, keeps the whole of the washers under the eye of the attendant, in patrolling the main passage between the compartments and drying closets. It also admits of some little classification of the *habituées* of the establishment—a very desirable point. Each compartment is about 3′ 6″ wide, 2′ 0″ in depth, and 4′ 6″ high, and contains ordinarily two troughs; one, that at the back, for boiling and rinsing, and the other for washing. Steam is supplied to the back trough for boiling purposes, and hot and cold water supplied to either by means of two cocks with long movable nozzles. The main



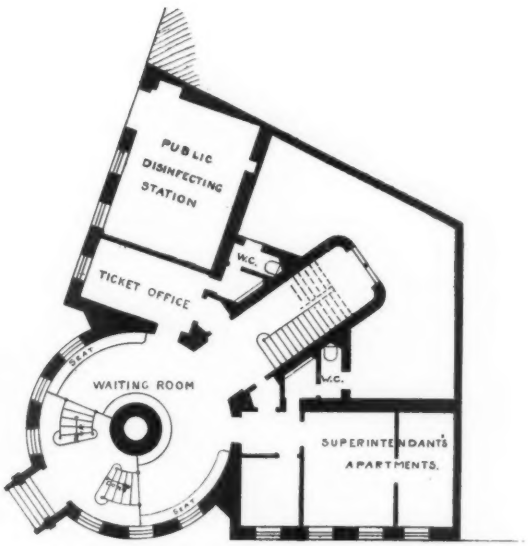
FIRST FLOOR PLAN



2ND FLOOR PLAN



BASEMENT PLAN



GROUND FLOOR PLAN

FIG. 13.—PEOPLE'S BATHS, SIXTH DISTRICT, ESTERHAYZ STREET, VIENNA.

hot and cold water supplies may be carried upon iron standards fixed along the top of the divisions, whilst that for steam should be carried along under the floor with upward branches to each compartment.

Along the top of the back division is fixed a wooden latticed shelf to take the linen when

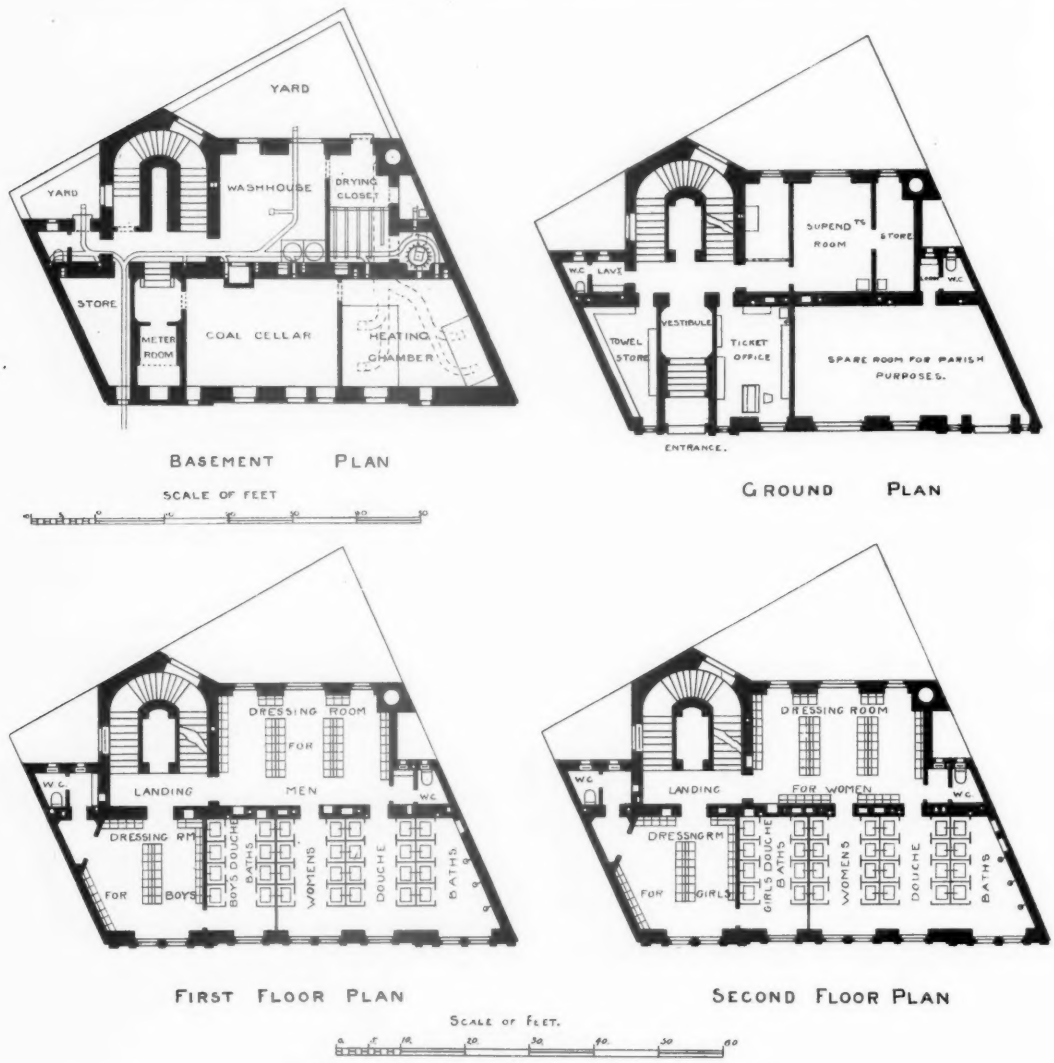


FIG. 14.—PEOPLE'S BATHS, FOURTH DISTRICT, KLAGBAUM STREET, VIENNA.

washed, and underneath receptacles for soap and soda. The divisions are commonly constructed of cast iron, galvanised or painted; but it is greatly to be desired that some other material could be used for them. I know of no kind of painting that will stand the hot soap and water, and the galvanised metal gets to look in time unutterably dirty.

The clothes, after having been washed, boiled, and rinsed, are then taken to the hydro-extractors or centrifugal wringing machines, which removes about 50 per cent. of the moisture from the clothes. It is a great mistake to employ the large-size machine one so frequently sees for this work, and when the gearing is overhead it is then very cumbrous, if not absolutely dangerous. To prevent this, the machines should be of a smaller diameter, 22″ say, and increased in number. They should be entirely underdriven, and so arranged that the washers may readily use them without danger or even supervision.

The heating of the closet is by means of coils of steam pipes, by which a temperature of 140° Fahr. should be maintained, and in conjunction with *efficient* ventilation the articles of the washers should be dried in twenty minutes.

In this matter of drying the clothes there is room for much improvement; for although there are several modes of effecting the process, none are perfectly satisfactory. Another point of importance is a better control by the washer of her own drying horse. In the old days of the Baths and Washhouse movement, a system was introduced, consisting of the combination of the drying closet with each washing compartment, and this was carried out in some few establishments, notably those in Glasgow, London, Hamburg, Berlin, Augsburg, and Metz. Although apparently this system was abandoned, it yet to my mind contains the germ of a perfectly practicable solution of this part of our problem.

Almost more than any other department, the public washhouse demands the best attention and skill of its architect and engineer, to find some efficient means of removing the large amount of vapour that in certain states of the atmosphere accumulates about its upper part. It is, however, a part of the very important question of the ventilation of all parts of the building, into which I must not go to-night.

The drainage into open channels from the wastes of the troughs, and the general surface drainage of the floor, together with the material and construction of the latter, require great care. The walls should certainly be faced with glazed bricks, and the construction of the skylights and interior of roofing over be of such a character as to be unaffected by moisture. It may be useful to remember that the average stay of a washer in the public washhouse is two and a half hours, and that the average quantity of water used by her is about forty-five gallons.

Mangling Room.—This adjoins the washhouse, and should contain one large and one small steam-driven box-mangle, and tables for folding, &c. Little or no ironing is done in these establishments, the washer preferring to do this at home. It is well, however, to provide a small gas stove for heating irons to meet the very occasional demand.

Waiting Hall.—A considerable amount of waiting takes place in this department, and provision should be made for some fifteen to thirty washers, each one of whom may possibly be waiting to take her turn in the washhouse as a compartment becomes vacant.

Cloak and Bonnet Room.—The best form of fitting this is by means of a series of small ventilated cupboards with lock and key; the same key should also be made available for the drying closet, corresponding in number of ticket or tally. If room can be found to provide a dry receptable for bonnet, shawl, &c., in the washing compartment, so much the better.

Crèche.—This is quite a new provision, and is really the outcome of an experiment which has recently been made in Edinburgh, and has been found to be a great boon to the frequenters of the washhouse. It consists of a large, light and airy room immediately adjoining the washers' entrance; where any washer having young infants, with no one to take care of them at home, may leave them here free of charge during such time as she is engaged in the washhouse. In addition to the large room, a store room, bath and sink room and w.c. should be provided.

In the first days of the movement it used to be customary to provide for two classes of

users of the washhouse, and in any provision for more than fifty washers this practice might with advantage be resumed.

Baths.—These are proposed to be accommodated as follows:—slipper and rain-douche baths for men upon the first floor, and with a due proportion of same on ground floor for women. One class of bathers only is catered for in these establishments, but there would be some difference in the prices charged for the use respectively of slipper and shower baths. A large waiting room with table, chairs, &c., is provided for each group. The second and third floors are appropriated to the use of the manager and his wife. The basement will amply provide for the necessary boiler, engine, &c., for the requirements of the building and storage for coal.

TYPE "B" (PEOPLE'S BATHS).

This, the smaller type of my branch establishments, is intended to meet, in the very cheapest and simplest manner, the needs of the very poor for cleansing facilities. It consists of very small establishments of rain-douche baths, built at very frequent intervals, in the poor and populous districts, after the manner of the Germans and Austrians, to the different systems of which countries I have already referred. There is a fear in some quarters that this system of warm and cold shower baths would not conform to the Baths and Washhouses Acts. This view is readily corrected by a reference to the Amending Act of 1847.

The accommodation consists of the double cells, 6′ 0″ × 3′ 3″, serving as dressing room and washing compartments. The temperature of the water would be limited by mechanical means to a temperature of 98° Fahr.; and the supply of this and the cold water is regulated by levers in the foot gratings or by chain pulls. The average supply of water consumed per bather in this bath is found to be about thirteen gallons. The divisions to the compartments should be constructed similar to those named for slipper baths.

These establishments can be made so small and compact as to permit of their erection under our streets in a manner similar to our underground lavatories and conveniences, and I trust ere long to see them so provided.

CONSTRUCTION.

Every part of the public baths, especially those used by the rougher class of visitors, is subject to very rough treatment. The construction should therefore be of such a character as to be able to resist the action of water in every form, whether from carelessness or from the necessities of frequent cleansing. Every part should be comfortable in its arrangement and appointments; and yet easily kept clean, free from vermin, and especially so with respect to the transfer of contagious matter; and last, but not least, it should give the impression of neatness and scrupulous cleanliness in all its parts.

The task of satisfactorily complying with all these requirements in institutions of this kind is by no means an easy one, especially when coupled with the necessity for wise economy in their resolution. Fortunately the evil results attending the adoption of materials and labour of a cheap and unendurable character are now more generally appreciated. Such a policy has too frequently carried with it its own punishment in the form of excessive periodical repairs, and frequently the cost of entire structural renewal at an early date.

ARCHITECTURAL TREATMENT.

Upon the subject of the external architecture of baths and washhouses, I would venture to recommend the general adoption of the principle, that the design of the building should clearly express its purpose, quite apart from all questions of style. I mean that a bath and washhouse establishment should appear exactly what it is, and not ape the dignity and

expression of the modern town hall. In the treatment of the natural outcome of the plans themselves, there are infinite opportunities for an original and distinctive treatment peculiarly suitable to its purposes and expressive of them.

It will be seen that the subject of this Paper is a very large one, and that it is impossible to do justice to it in one evening. I have, however, done my best with each portion of it relatively to its importance in the time at my disposal.

DISCUSSION OF MR. TILTMAN'S PAPER.

Professor AITCHISON, R.A., *President*, in the Chair.

MR. WM. EMERSON, *Hon. Secretary*, in proposing a vote of thanks to Mr. Tiltman for his very able Paper, said he should like to have heard something as to the best method of constructing a large swimming bath to hold water. He had hoped that on the question of construction Mr. Tiltman would have touched on that point.

MR. H. L. FLORENCE, *Vice-President*, in seconding the vote of thanks, said that he had not quite understood the rain-douche arrangements. If bathers had to use the rain douches before entering the swimming bath, it would lead to a great revolution in the general plan of the baths, because it would seem necessary that the dressing boxes should be in direct communication with rain douches; otherwise, if they were put in their usual position round the swimming bath, there would be no guarantee that the bathers would take the douche before entering the bath. Considerably greater space would probably be necessary in order to provide dressing boxes and rain douches, for a pathway round the bath would still have to be provided. The system of rain douches, however, would be much to the advantage of the people if they could be induced to take kindly to such a novelty. He scarcely felt inclined to agree at once with the use of the York pavings for the landings round the bath. He had always found slate the most suitable and the most pleasant material for that purpose, and it was easier to keep clean.

MR. A. T. BOLTON [*A.*] observed that the last speaker might have told them that he was the architect of one of the oldest baths in London, and one of the few that could claim to be self-supporting. One of the great difficulties of London baths was to make them self-supporting, and the baths in the West-end to which he referred owed their prosperity, he believed, to a large extent to the extensive patronage of the first-class swimming bath. Mr. Tiltman said that the baths should not be in the nature of town halls. Unfortunately, the particular bath he (the speaker) was alluding to had to do duty as town hall, and the use of it during the winter for meetings and entertainments constituted one of the difficulties of the management. It would greatly simplify matters if baths were to be used only for bathing, for there was much difficulty in providing sufficient exits and entrances and other requirements that might be necessary in a public hall, but which were not so in a bath. Mr. Tiltman thought the County Council would not allow of staircases up to the gallery in a case where the gallery might be used for dressing boxes. But in this particular bath, though they had a severe struggle with the London County Council when applying for a licence to use it for music and dancing, this was not one of the points objected to. The gallery in this instance had two circular staircases at one end for access on either side, for the sole use of bathers when the gallery had to be utilized for dressing boxes. With regard to the noise of the swimming bath, that was a matter worth more attention than it seemed to the speaker to have received in the design of these buildings. It arose from the excessive amount of glass in the roof. Glass was a bad substance from an acoustic point of view; every splash of water was re-echoed from the glazed surface. If the glass area in the roof could be restricted or confined to a cove or to the vertical sides of a long lantern or clerestory, leaving a central part of some other material, it would be very much better. That was the great objection to the otherwise excellent fittings of the Westminster Baths. The water chute there was a most alarming apparatus to quiet bathers; and for that reason it could not be introduced into the bath he had spoken of. The better-class bathers did not also care for another feature of the Westminster Bath, the overhead shower, which was delightful in summer. Jets of water were sprinkled all over the bath from a perforated pipe running down the centre of the roof. Ferns could be grown in baskets suspended from the roof, and the atmosphere was kept nicely cool, but many swimmers were very sensitive on the point, and objected to being sprinkled while swimming. In the bath built by Mr. Florence there was a fountain at one end, which was objected to on the same score. Separating the entrances for men and women, and having two separate ticket boxes, had not always been found necessary. Great economy could be effected by having only one ticket box, approachable on either side, so that one clerk could attend to both. The addition

of a refreshment room to the bathing establishment had often been called for, but was difficult to arrange for in the old class of bath. If it could be combined in some way with a tea shop, under other management, for which rent would be received, it would be profitable to the bath proprietors and agreeable to the bathers. In regard to the general treatment of our bath buildings, it was to be regretted that they so often were mainly utilitarian in design. The Arabian baths at the Alhambra in Granada, with their vaulted roofs perforated with star openings for ventilation, might be suggested as an ideal.

MR. A. SAXON SNELL [*F.*] said that any one who had had the privilege of going over the new swimming bath at Shoreditch would feel that great strides had been made towards the ideal in baths. It would seem that at last imagination was beginning to touch even our vestries and municipalities, and when our rulers and clients began to "dream dreams" it was good for architects. With regard to providing small bathing establishments, great economy might be attained by using them on alternate days for men and women. It would be found that the bathing time for men and women differed very much: women generally went in the morning, and men nearly always in the evening. In one large borough where he was building some baths, the idea was to economise superintendence by erecting several baths and spreading the officers over them as required. He agreed with Mr. Tiltman upon the question of having small establishments instead of large ones, because of the difficulty of getting people to go to big central baths; they were not so popular as they ought to be, because they were distant from most of the homes of the people. The description of the shower and rain-douche baths was interesting, and would very likely be followed by a great increase in their numbers in London; it was to be hoped so, because they could be made and administered so cheaply. He had read an account of a manufacturer in the North of England who provided these shower baths for his workpeople; and he found that they could be built and maintained at a very small cost. Such baths would be a great boon in London. With regard to entrances he went one step further than Mr. Bolton, he hoped separate entrances for men and women would be abolished altogether; they were a nuisance in planning and an expense in administration. They were no more necessary in public baths than in railway stations. As regards the size of the bath, he was glad to hear Mr. Tiltman say that he thought the maximum size should be 100 feet by 35 feet. A hundred feet was a very good racing length, and 35 feet was quite wide enough; in view of the enormous expense of water alone, those dimensions should suffice. Slipper baths on the first floor were practicable, but he did not agree with Mr. Tiltman that they should be on more than one floor. It was better they should all be on one floor, because sometimes the slipper baths were little used except at certain hours of the day, and it was an economy to have one attendant to attend to two sets of baths, which would not be possible if they were on different floors. At the Marylebone Baths some of the dressing boxes were arranged in transepts. He was surprised to hear Mr. Tiltman say that the internal angles of the swimming bath should not be rounded—unless he meant that they should not be rounded to too large a radius, which would interfere with swimming races. He would prefer to have not only the vertical angles rounded, but the angles of the bottom with the sides also. With regard to woodwork dressing boxes, he had a preference for the old fashion of woodwork and doors, thus insuring that privacy which many people still considered a desirable thing. Paints were to be had which were absolutely impervious to wet, and wooden boxes painted with these paints could be kept perfectly clean, because the hose could be turned on to them without injuring the wood.

THE PRESIDENT said he hoped most ardently that slipper baths and other abominations would be done away with as soon as possible. Our idea of cleanliness seemed to be first to wash our dirt off into something, and then to wash ourselves in it. The shower and rain baths referred to would do away with that. He recollected a Member of Parliament, one who was prominent in starting the Turkish baths, pointing out that there was no sense of cleanliness amongst Europeans generally. To find it they must go to the East, where people took care that the water they had once washed in should never go over their bodies again.

MR. TILTMAN thanked the Meeting for the kind reception they had accorded his Paper, and explained that owing to deafness he had not been able to follow the discussion, and so could not reply at present to the criticisms thereon. He then drew attention to some plans of the German baths referred to in the Paper, and explained their points of interest.

Mr. Tiltman, having been furnished with a proof of the discussion, sends the following reply:—

The simplest and best method of constructing a large swimming pond is to have a good, sound, and equal foundation for it; to form the shell of Portland cement concrete, the inside of which should be rendered in cement and lined with asphalte. After the tank has been tested by being filled with water, it may then, if found watertight, be paved with white glazed bricks or other equally suitable material. There is no particular novelty in this mode of construction, but with the great care exercised, I have never had a serious leakage in any of the many ponds I have built.

As to the effect upon the arrangement of the

dressing boxes of the swimming baths, by the adoption of the preliminary warm douche advocated, I may say, from what I saw of the German baths, that, providing the douches are liberal in number and conveniently arranged at one end of the bath, no alteration in the general plan appears to be required. There is but little doubt in my mind that the rule was the reverse of irksome to the bather, and that it was there, and could be with us, an additional attraction of the swimming bath, providing the water is kept suitably warm, and the room of the temperature required. I have tried both slate and York stone for the paving of gangways; in my experience the former wears greasy and slippery, whereas the stone is generally free from these and other objections. I shall be glad to show Mr. Florence, or any others interested, the two materials in use.

Experienced superintendents of these institutions I find frequently would prefer the separation of the ticket-boxes *for classes*, rather than that for the sexes; but it is very seldom that it is either practicable or even desirable to have all classes of patrons entering at one point of the building. In any case, the entrance to the public washhouse must be kept separate from that for bathers. Generally for the Central Establishment described by me, I still adhere to the recommendation made upon this point in my Paper.

There is no gainsaying the advantage of having all the slipper baths upon one floor, except in the circumstances referred to by me; but, subject to this, Mr. Snell's point is always worth remembering. My reference to the non-rounding of the internal angles of the pond was certainly not intended to include this necessary provision for the angles of the glazed brick-lining, but was, of course, applicable only to the practice still very common of rounding to a large radius the curb-edging of the pond. As to the inadvisability of painted wooden dressing boxes for the rougher class of swimming baths, I am inclined to think that when Mr. Snell has faced the criticisms of many committees and the managers of their establishments for nearly twenty years he will have altered his views upon this point.

Mr. E. Harding Payne [*A.*] sends the following contribution to the discussion :—

In contributing a few notes on Mr. Tiltman's able and exhaustive Paper, I do so as a swimmer of many years' experience, still taking an active part in swimming and legislation for the sport. While agreeing that more might be done in inculcating the desire for, and necessity of, cleanliness amongst the poorer classes, it must be admitted that very great strides in this direction have been made during the past few years by the voluntary teaching of swimming in Board Schools all over the country. Since the London School Board has recognised swimming as a branch of physical exercise, the London Schools Swimming Association has made great progress, and their Report for 1898 shows that nearly five hundred schools are affiliated to them, and that 40,000 children were instructed last year, four boys and one girl receiving the Royal Humane Society's certificate for saving life. Their efforts are still much confined, owing to insufficient accommodation and want of teaching baths.

Now that the children are taught by means of a drill, it is possible for one teacher to instruct a whole class of sixty children at word of command, and two small baths, each 45′ 0″ × 15′ 0″, side by side, would be sufficient for this number at one time, or one large bath, 45′ 0″ × 33′ 0″, divided by a bridge, would answer the purpose. There are special details that would have to be considered in a pond of this kind, and it would be much better if a bath for each group of schools could be devoted entirely to the purpose of teaching. While for economical reasons a more limited main frontage is to be advocated, at the same time for larger establishments a frontage in a leading thoroughfare is essential to attract the passers by, especially in warm weather, and this would tend to financial success. The quadrangle system suggested is no doubt advantageous on some sites, but it must not be overlooked that there is an extra cost in the erection of porter's lodge, and building four frontages instead of one, in addition to roadway to be kept up and porter's wages, as against any saving in corridor. It is a mistake to make swimming baths of such large dimensions. Four baths, if suitably placed, of the size of Kennington Road and Hornsey Road baths would be sufficient for the whole of London, were the seating properly arranged so that a large number of spectators could be accommodated. Baths should be smaller and more equally distributed among the population. 100′ 0″ × 35′ 0″ is the best size for a first-class swimming pond.

The gallery accommodation in most swimming baths is little better than useless. Even where the gallery floor is stepped, it is generally impossible for more than one row of spectators to see comfortably what is going on in the swimming pond, and then only by leaning over the gallery rail. If the baths are to be used for these entertainments at all, it is time some better arrangement was adopted. One attempt in this direction has been made at Leicester, where the gallery is in the form of an amphitheatre stepped up from the gangway level, with the dressing boxes at the back, and openings at intervals for access to the bath. As this particular bath is on an open site, it has been possible to get external light and ventilation for this back corridor, which in restricted sites could not be obtained, and would be a fatal disadvantage quite apart from the difficulty of supervision. But for swimming displays or public entertainments or meetings in the winter, the Leicester bath is a distinct advance. Another endeavour to meet the difficulty has been tried at

Shoreditch Baths, where expensive collapsible boxes under the gallery are provided. Whether the space gained justifies the expense seems doubtful.

I quite agree that good York stone is better than marble and slate or any of the other materials generally used for the gangways. A better decorative appearance might perhaps be obtained if used in conjunction with some other material. India-rubber would present an ideal non-slipping surface, and, if more durable, would be better for the purpose than any material now used.

There are other features connected with the first-class swimming baths that are overlooked in many cases. A means of communication from one end of the bath to the other within the building, but outside the bath, is absolutely essential where baths are used for swimming entertainments, and seems necessary for most purposes to which a bath could be put when used as a hall. Again, it does not seem well that the Referee's platform and press accommodation should be left to an afterthought; if provided at all, they should form part of the original design.

I feel sure that to increase the number of dressing boxes in addition to those usually provided down the two longer sides of the swimming bath would be a mistake. When all the dressing boxes are occupied the bath would be uncomfortably crowded. Again, arranging boxes in transeptal bays would, I think, be encouraging theft, which even now cannot be entirely prevented, owing to difficulties of supervision.

The rain-douche bath is a most excellent way of providing an economical and efficient bath, and will, I hope, be given a fair trial. Its adoption was suggested some years ago in connection with collieries, and seems admirably adapted for a large number of persons to bathe with celerity. The proposal that they should be used in connection with swimming baths is excellent. It would be an advantage in the case of second-class swimming baths, but would be treated more as a luxury among first-class bathers. It is doubtful whether they would not prefer to use the warm douche, followed by the cold douche, after instead of before the swim. The idea is not altogether new to our swimming baths. At the old Lambeth Baths twenty-three years ago, and at the Crown Baths, Kennington Oval, at a later period, there were hot water fountains, but, as bathers congregated about them, they were found to be a nuisance, and were removed.

I would suggest that where easy communication can be made between the first-class slipper baths and the swimming bath it should be done, so that bathers for an extra fee could have a cold plunge after a warm bath, a luxury which would, I feel sure, prove popular.

There always seems a doubt as to how many slipper baths to provide. Space might with advantage be left for future extension of the different classes until the requirements of the district can be discovered from actual working.

9, Conduit Street, London, W., 11*th February* 1899.

CHRONICLE.

Election by Recommendation of Allied Society.

At the Council Meeting of Monday the 6th inst. the following gentleman, unanimously recommended for membership by the Council of the Allied Society at Bristol, and found to be eligible and qualified according to the Charter and By-laws, was, under the proviso to By-law 9, duly elected Fellow of the Royal Institute:—

George Herbert Oatley, Edinburgh Chambers, Baldwin Street, Bristol.

The Home Insurance Building Fire, New York

The Science Standing Committee send for publication the following letter received by their Hon. Secretary, Mr. Searles-Wood, from Mr. R. W. Gibson, the author of the Paper on "Fireproof Construction in the United States," read before the Institute on 5th December last [p. 49]:—

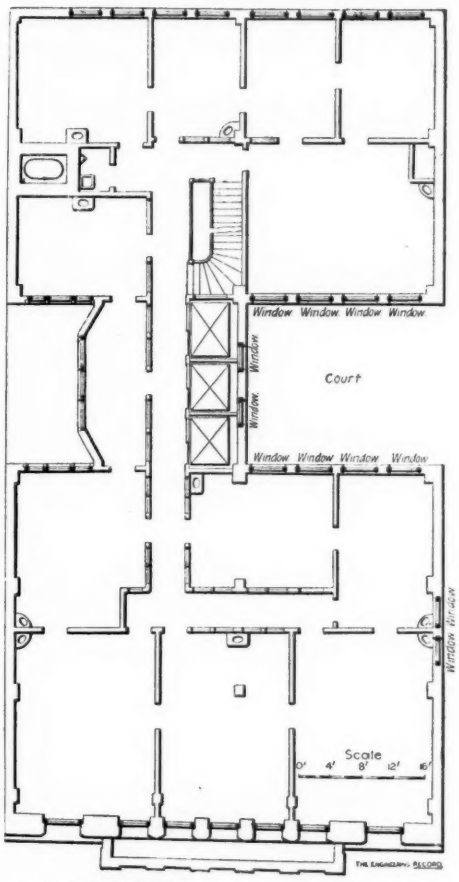
"Since I sent you my Report on Fireproof Construction we have had a great fire, which has confirmed my opinions in most complete fashion. It was in one sense an unfair test, because the fireproof building was subjected to an intense heat generated in an adjoining non-fireproof building, while a gale blew from that side at 60 miles an hour, or more, making the high building (which had a court recessed in its side) practically a chimney for the terrific fire, with *windows in the chimney*.

"I am sending you a number of the *Engineering Record* and a collection of newspaper extracts, which you will find to contain a complete account and many comments.

"It is a vindication of the fireproof structure, and a condemnation of the imperfect and unthorough details. It will lead to higher insurance rates at first, then better details in the direction I have advocated—less wood and fewer windows at side. There is no 'ancient light' law here, and consequently people put windows in side walls frequently over other buildings.

"I am now designing a building to be erected this season with *no wood whatever*."

The *Engineering Record*,* duly to hand from Mr. Gibson, has a complete description of the mischief wrought by the fire upon every part of the structure, together with illustrations showing the condition of the damaged building at various points. The accompanying plan is reproduced from its pages. Some of the effects of the fire



PLAN FROM NINTH FLOOR UP SHOWING LIGHT COURT.

and of the lessons taught by it have already been touched upon in the JOURNAL, in Mr. Wonnacott's communication, printed at page 100; lengthy quotation from the *Engineering Record* would therefore be superfluous; but the Science Committee consider that the few following extracts may be usefully given:—

The Home Life Insurance building had a front of about 63 feet, and a depth of 104 feet to the west. It showed fifteen stories and a mezzanine on the front, and the main roof is 206 feet above the curb. On the roof was built a sixteenth story, for janitor's apartments, etc., and the building was surmounted by a pyramidal tower reaching to a height of 260 feet above the curb. It is indented along its north wall by a light court about 20 × 24 feet in size, as shown in the plan, which indicates the general arrangement of the floors from the ninth up, and serves to show the location of this court, which acted as a chimney when the flames from the adjacent building were driven into it. . . . The upper floors are similar in general dimensions, but vary in arrangement of partitions. Above the floor shown, the east and west walls of the light court are braced at every second story by a horizontal latticed strut in the north face of the building. . . . The Broadway front is of white marble. The building was erected in 1892 and 1893. . . . The building in which the fire originated * was filled with combustibles, and the flames, escaping through the windows and roof, were blown directly against the north walls of the Home Insurance Building. Although subjected to an intense heat, the building did not take fire for some time. The firemen entered the Home Building and endeavoured to protect it with hose streams from their engines and from the fire pipes in the building. About an hour after the fire broke out the roof of the corner building fell in. A great volume of flame was blown against the north side of the Home Building, and, converging in the open court there, was swept upward as if in a great chimney. An intense heat was thus concentrated upon the three walls of the court, and the glass in its upper windows gave way. It was said that the different stories thus caught fire independently through the court windows, and probably almost simultaneously. . . . Above the eighth floor the interior of the building is wrecked, and its contents almost entirely destroyed.

Throughout these stories the woodwork and contents of all the rooms adjacent to the north court were burned. The fire did not extend south of the main corridor on the eighth floor, and on the ninth floor did not burn either south or west of the main corridors. In the upper stories some of the rooms in the south and south-west parts escaped wholly or partially. Above the eleventh floor the flames appear to have been the fiercest. In the main corridor on this floor the ironwork of the elevator shafts was badly distorted, and the flames swept through it and the rooms south of the adjacent corridor, and burned through the windows in the south wall of the court or light shaft between this building and the Postal Telegraph Building. This court is 20 × 10 feet. The corresponding windows in most of the floors above were also burned out, and the flames emerging from them scorched the woodwork of the adjacent walls and windows of the Telegraph Building, and set fire to some of the upper rooms, which were saved without serious damage. Rather less damage was done by the flames in the thirteenth floor than in the other upper stories. . . .

Throughout the burned portion of the building the double wood floors were in general burned in those rooms adjacent to the north court, and in some of the other rooms, but they were not burned in all of the rooms on the east, south, and west sides of the building. The solid parts of the partitions were built of four-inch hollow porous terra-cotta blocks, and the girder webs were protected by porous terra-cotta blocks. The partitions in general stood well, except where weakened by the destruction of large areas of glazing and the wooden trim and doors. . . . Most of the plaster had disappeared from the walls and ceilings, and much of the inside brickwork was loose. In the tenth story the partition wall on the west side of the west corridor was intact, and the public toilet rooms beyond were uninjured, although the adjacent rooms surrounding the court were burned out. The contents of the sixteenth

* 10th December 1898, a copy of which is in the Library.

* A five-story brick building of old-fashioned construction, with wooden floor beams, occupied as a clothing store by Rogers, Peet & Co., and by offices on the upper floors.

story were destroyed, but the tower above sustained no apparent injury. In the fifteenth story one of the floor arches had fallen for a length of about 20 feet. . . .

In the north-east corner of the twelfth story, some partitions, two inches thick, made with plaster or cement on a framework of expanded metal and small angles lightly secured to the floor and ceiling, although badly distorted, were effective and remained standing. In these rooms a small interior closet, having three sides and a top, was made of the same construction, and, although torn out and knocked over during the fire, was found on the floor, its original shape retained, like a three-sided box. . . .

The building was of steel cage construction, with riveted columns and flat arch floors. The front wall, however, was self-sustaining and independent of the framework, except as attached to it by lateral anchors. The walls were lined and the columns encased with two-inch porous terra-cotta ribbed furring blocks, which, with few exceptions, remained in position throughout the fire. The lower flanges of the main girders where they projected through the ceilings, and the solid-web knee-bracket wind braces between columns and girders, were protected by plaster or cement on wire cloth wrapped around them, and this in general was not destroyed, although in places it was noticed hanging so as to expose the steel surface. In a few places the blocks had fallen from the columns, exposing their vertical faces, which did not appear, however, to have been injured. In the fifteenth floor a line of deep plate girders near the Broadway front, and parallel to it, projected several inches above the floor line, and had apparently been boxed in with a wooden cover, forming a step, but without fireproofing to protect them. They were found exposed and considerably buckled and deflected, although still performing their service in apparent safety.

Below the eighth story there was no direct damage from the flames. Up to the sixth floor, the north court was shielded by the south wall of the Rogers, Peet, & Co. building, which is still standing. Above that point, it was exposed to the full intensity of the flames, and two or three of the lower horizontal steel struts connecting the east and west wings across the north end of the court at every second story are considerably bent and distorted, although still in position. The upper ones are hardly injured. With these exceptions, and that of the iron window frames exposed to the flames, no material injury was evident to the main structure or the steel framework.

The floors consisted of transverse and diagonal matched boards nailed to wood strips on top of the steel beams, between which there was an open-air space several inches deep under the floor boards and over the arches. Throughout the building the floors were hard-burned hollow-tile flat arches, side construction with protecting skewbacks. These spaces were divided by concrete stops at intervals, built up solid from the arch to the floor board, which evidently in many cases prevented the burning of the floor through to the southern side of the building. The rooms adjacent to the large court and three corridors, and in some cases the rooms at the north-east corner on the Broadway front of the building, were most damaged. . . .

The stairways and corridors were not destroyed, and the transmission of fire seems to have been external rather than internal; that is, through the windows from the outside, from story to story. The essential structural members of the building were safely preserved, and the result of the fire was simply to burn separately the contents of different rooms which were more or less independently ignited. If the windows had been protected with steel shutters, it is possible that the contents of the building would have been practically uninjured and the fire confined to the building in which it started.

Space will not permit of extracts from the little book of newspaper cuttings sent by Mr. Gibson; but expert opinion quoted therein appears to be unanimous that the claims put forward for steel skeleton buildings, when properly fireproofed and constructed, have been satisfactorily proven. The President of the New York Building Commissioners states that the building successfully resisted the spread of a blaze which, had it not been opposed by such a barrier, would have probably spread beyond all bounds, and rendered necessary the blowing up of many buildings in the vicinity, such as the Astor House, for instance, to prevent its further spread.

The Plumber's Craft.

At the banquet of the Plumbers' Company, held on the 18th ult., the President, Professor Aitchison, R.A., responding for "The Guests," said:—

The Plumbers' Company have done a most excellent work in having those plumbers that are masters of their trade certificated; and I may say that there is a great dearth of them, for when I ask builders why they have not a certificated plumber, they say it is impossible to get one.

The principal thing we require is to have men who can be trusted to wipe joints so that they are air-tight, and make other junctions air-tight too. By this means we have prevented a great many of the diseases that faulty pipes and junctions cause, and have besides improved the health of those persons who would otherwise have their health lowered by the exhalations from faulty pipes; and besides these advantages they have learned to execute ordinary plumber's work much better. We cannot be too careful of our health, for without that life becomes a burden: but at the same time we must consider "that man does not live by bread alone." Nature spreads out before us all the beauties of the sky and the earth and the ocean for man's instruction, delight, and solace, and the plumbers were of yore as skilful in embodying the beauties of nature they had admired as the other craftsmen in the building trade; in fact, when I was a boy, the plumber's shop-window was one of my greatest delights, for in it were beautifully ornamented cisterns, lead vases, lead statues, and ornamental lead plaques for dates and inscriptions, not to speak of the quaintness or beauty conferred on rain-water pipes, and their heads. All this has departed, and certainly every architect and every person of taste is anxious to see it revived. Some of the walks in Hampton Court gardens are still adorned with leaden statues and leaden vases, and when I was a boy the gardens of the great merchants in the City were adorned in the same manner, and very often with lead fountains. In the Middle Ages and the Early Renaissance considerable portions of the buildings then erected were ornamented with leaden crestings on the roof, there were lead tops to pinnacles, and lead sockets to weathercocks, and the leadwork to the lights was made in beautiful or curious patterns; and I don't know why all these charming

applications of design should be utterly laid aside and forgotten for mere utilitarian objects.

The exercise of the artistic part of his craft must surely give more pleasure and pride to the craftsman than the mere wiping of a joint, however well done, or the beating out of a cesspool, besides the interest and pleasure that it causes to the public.

I hope your Company, while still continuing to instruct the workman in that which regards our health, may also add to his cultivation and interest by showing him that he has not yet mastered the whole of the craft when he can execute properly the mere utilitarian parts of his trade.

Ornamental plumbing is not entirely disused, as there is a beautiful leaded lantern on one of the churches at Brighton, designed, I believe, by Mr. Bodley.

Obituary.—Members will learn with regret of the death on the 8th inst. of George Andrew Spottiswoode [*H.A.*], head of the well-known printing firm that is conducted under his name. Mr. Spottiswoode was one of the earliest Honorary Associates of the Institute, having been elected in 1877.

NOTES, QUERIES, AND REPLIES.

Dr. Ussing on Vitruvius.

From R. Phenè Spiers [*F.*], F.S.A.—

Dr. Ussing in his "Observations on *Vitruvii de Architectura Libri decem*," published by the Institute, attempts to throw discredit on their author. He says: "Instead of an excellent architect from the glorious Roman period, we find a shallow-minded, ignorant man who boasts of knowledge which he does not possess." That is not the opinion of the English architects who have translated his works, nor does it agree at all with the judgment of perhaps the greatest classic architectural scholar of the day, whose loss we all deplore—the late Dr. Middleton. In his exhaustive work on the Remains of Ancient Rome, Dr. Middleton refers to Vitruvius no fewer than eighty-two times, his references filling nearly two columns of the index. There is scarcely a subject treated of in the two volumes referring to the construction of the earlier buildings of Imperial Rome, or to their decoration with stucco or painting, in which he does not quote Vitruvius as the greatest authority thereon. M. Choisy in his *Histoire de l'Architecture* continually refers to Vitruvius as the chief authority on early Roman work, and in his first lecture this year at the Royal Academy, Professor Aitchison, our President, says, "In my future lectures I shall quote largely from Vitruvius," which it is scarcely likely he would do if Vitruvius were the impostor Dr. Ussing has tried to make him out.

Sir Christopher Wren.

Mr. John Cotton [*F.*] sends the following letter, the original of which is in the Bodleian Library, Oxford, as being possibly of interest to members:—

Hampton Court. Jan: 29: 1719.

Sr

In answer to y^rs^ of ye 20^th^ inst. desireing my opinion wch of the two Gates goeing into Westminster is the newist Gate & in wch Kings Reigns each of y^m^ were built: and allso abt' what time the great Gate wch goes into Whitehall was built, & by whom: I can only at present acquaint you, that I believe the two first-mention'd Gates were both built by K Henry ye Eighth: That which is next to King street & adjoyn'd to L^d^ Rochesters, I take to be much later built then ye other, The Gate wch leads into Whitehall was built by Cardinal Wolsey. As to the Boundaries of y^r^ Parish, I cannt so well inform you, as y^r^ Parochial Record's for I doe not remember I ever was imploy'd in that enquiry.—

I heartily pray for the Prosperity of y^r^ Parish, and Success in y^r^ present proceedings for ye Rebuilding y^r^ Church; and am at all times

y^r^ sincere friend & humble Serv^t^

Chr. Wren.

To The Rever^d^ D^r^ Greene
Vicar of S^t^ Martins in
the Fields London

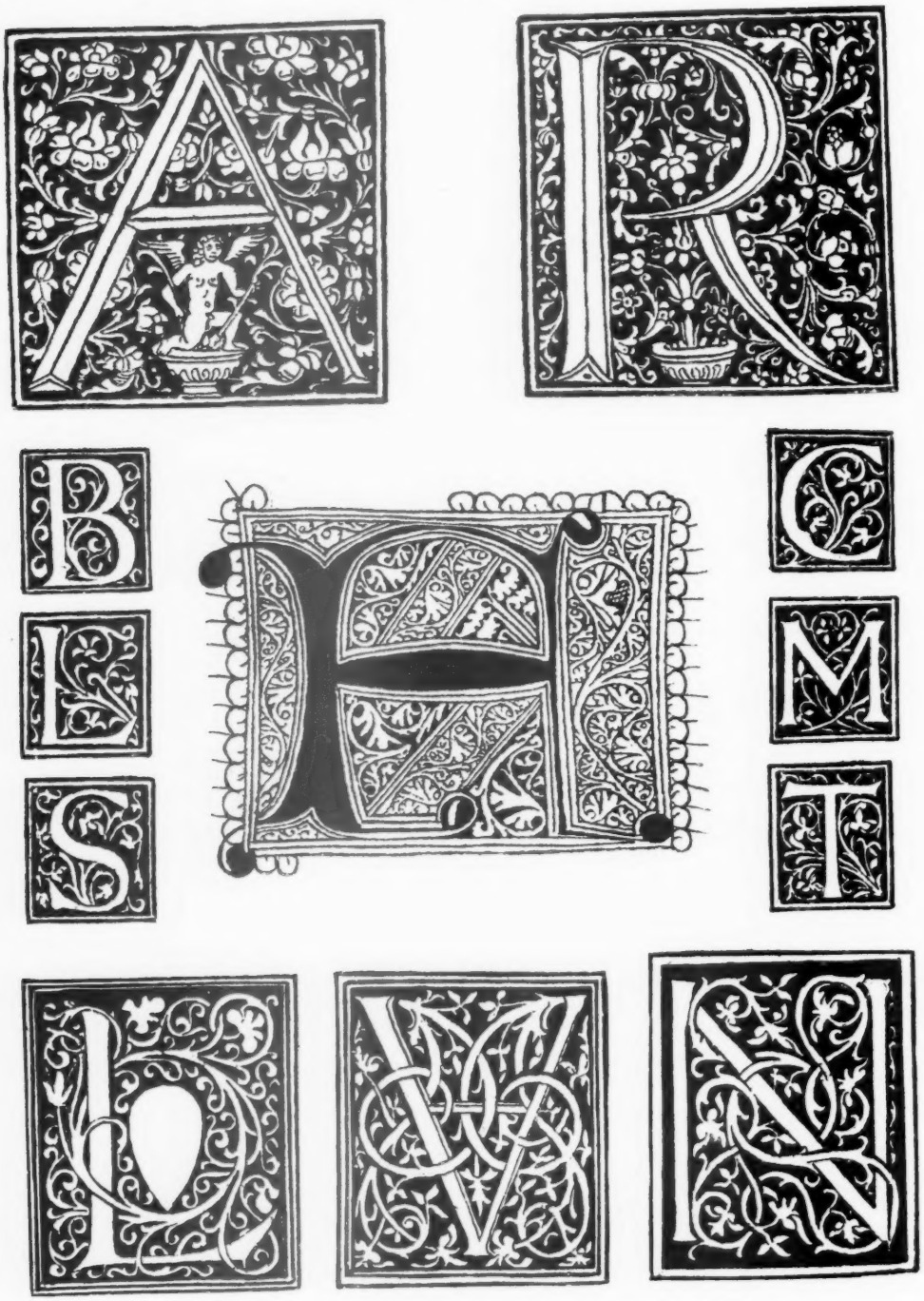
REVIEWS.

A MANUAL OF ALPHABETS.

Alphabets Old and New: containing over 150 complete Alphabets, 30 Series of Numerals, and numerous Facsimiles of Ancient Dates, &c., for the Use of Craftsmen; with an Introductory Essay on "Art in the Alphabet." By Lewis F. Day. Sm. 8o. Lond. 1898. *Price* 3s. 6d. *net.* [*B. T. Batsford*, 94, *High Holborn.*]

The latest of Mr. Lewis Day's text-books is likely to be as much sought after as its precursors have been, and this handsome manual of alphabets will be an improvement upon the older little unbound paper book that passes current in many architects' offices. It is perhaps scarcely so attractive to the general reader as Mr. Strange's book on Lettering of about two years ago, which deals with its subject in a less specialised manner.

Architects, being amongst the few who have preserved the old traditions of lettering, should be reluctant to adopt more labour-saving devices in the completing of their drawings, and ought not, in spite of modern tendencies, to grudge the indispensable time, more especially in the case of pupils, that the acquirement of a really good style of printing requires. In this respect it is somewhat of a drawback to Mr. Day's book that it presents rather too much of a short cut. It is laborious, perhaps, to pick out the letters from some original, or reprint, of a good example, and it will be much easier to take an alphabet direct from his pages; but a good deal of instruction may be missed in the process, as the whole effect of the type is not the same when seen as an



LATE FIFTEENTH-CENTURY EXAMPLES, FROM ONGANIA'S "EARLY VENETIAN PRINTING."

alphabet as when presented in a long passage of words. This fact appears to have been grasped by one of his contributors, an architect, who in giving his version of the alphabet adds below in his lettering, "Design letters into words." The chief lesson of the book is the extraordinary variety with which the alphabet can be rendered, and the amount of character that can be obtained therefrom, such as is revealed in the various examples given. It might be said that this element of personality has affected the representative character of this particular book, and that the author's bias is displayed in the selection he has made. In the Italian examples, for instance, some rather *outré* specimens are given, and a much finer impression of the style would be gathered from Ongania's reprint of the early issues of the Venetian press, a work just added to the Library.

The book before us is nothing if not up to date, but we find it rather difficult to follow the author in his treatment of old examples. This is what he says:—

"The ancient lettering illustrated in these pages has been taken, as far as might be, from original sources, and drawn with every care to keep the spirit of the original. *I have not scrupled, however, to supply the letters missing in old manuscripts or inscriptions*; for, presumptuous as this may appear to the scholar, he is not likely to be perplexed by it, knowing well the letters which would not occur in the original script; on the other hand, the practical workman, to whom the book is addressed, will be thankful, perhaps, for alphabets as complete as possible."

WOOD-CARVING [Lewis F. Day]. From *Alphabets Old and New*.

As elsewhere the aim of the book is described as that of illustrating the influence of the tools employed on the characteristics of the letters, we are in the presence of a serious confusion of thought and method.

Either no dates or styles at all should be given, and all old examples should be treated as fair game for use, with a sole regard to the tool employed; or else, if periods and styles are quoted, it is obvious that non-existent letters cannot be supplied, on account of the solecism that would result in a correctly imitated inscription that contained nevertheless certain impossible letters for the period adopted.

The idea of treating writing according to the tool employed is an attractive one, but it has certain limitations. Not the least of these is beauty, for not a few would decline to accept such treacly - looking letters as No. 144, whether the outcome of *gesso* on a brush or not.

On the other hand, though it may be heresy to say so, the purport of the inscription will exercise great influence on the lettering adopted. There is in the cloister of the Abbey a stone tablet charmingly inscribed in a flowing hand, that possesses the personal touch that we associate with a letter from a friend; and this is the style also of some of those quaint, and often pathetic, exhortations to be found in old country churchyards, such as commence "*O Wayfarer*," and convey sentiments that would seem to verge on the brutal, or the absurd, if rendered in a severe and monumental style of lettering, better adapted though

that might be to the material and tool employed.

Of the book in general, there are 178 pages, of which thirty-nine are text, and we anticipate that the majority will confine their attention solely to the plates, and perhaps not unwisely, for frankly the letterpress is not the strongest part of the book.

The fore part is hardly made so interesting as the subject would seem to suggest, while the conclusion is an instance of the recurring difficulty writers seem to experience to-day in treating one subject at a time.

We have all an itch for cheap philosophy, and we demand so much more of our teachers than *a b c*. Our author has his ideas of the disease of this age of machinery, and in winding up his text discourses upon the subject as follows:—

"The great difference between the old lettering and the new is that in days before stereotyping the scribe was free to play variations on the well-known alphabetical air, whereas our print is monotonous as the tune of a barrel-organ.

"Pedants are never happy till everything is fixed. But nothing is fixed until it is dead—life is in movement. Philosophy has long since given up the search for perpetual motion, but that is the secret of it—life—and that is the evidence and sign of life—motion. The question is: Are we alive?"

We may take the book as evidence of the author being able to say "yes"; and we certainly hope he will continue to be able to reply the same, for in, say, ten years' time, we can count with confidence on his joining in the laugh which this portentous excursus upon his *a b c* is calculated to provoke. ARTHUR T. BOLTON.

LEGAL.

Interference with Light: The Angle of 45°.

Mr. Justice Byrne, in the Chancery Division on the 23rd Jan., gave judgment in the case of Smith and others *v.* The Devon and Exeter Turkish Bath Company, which was an action for an injunction restraining the defendants from obstructing by their building opposite to the chapel the light coming to certain windows in the chapel and classrooms beneath.

His Lordship said that opposite the chapel there formerly stood almshouses, which were pulled down. Defendants having acquired the greater portion of this site near the chapel, proceeded to erect thereon baths, and over them bedrooms, intended as an adjunct to the adjoining hotel. Looking at the evidence of those in the habit of teaching in the classrooms, and at the evidence of the caretaker as to the necessity for the use of gas during three summer months, which did not arise prior to the pulling down of the old almshouses, he could not resist the evidence that there had been a material diminution of the light. One argument had been founded on the suggestion that a portion of the site of the old almshouses, not yet built upon, afforded a certain amount of diffused light, which was sufficient compensation for any light of which they might have been deprived, and that therefore he was not to say there was obstruction. But he came to the conclusion that, as the building stood, the light coming to those classrooms had been materially interfered with. Having decided the question of fact in favour of the plaintiffs, the question was—What was the proper order to make? It was clear that there should be an order to pull down some portion of the defendants' building. He could not do better than adopt the angle of 45° obstruction rule; and in doing so, and having regard to the narrowness of the thoroughfare, and to the other circumstances in the case, he was disposed to think that he was giving the defendants the benefit of the rule rather than imposing something stronger than he might impose. Accordingly he held that the plaintiffs were entitled to a mandatory injunction directing the defendants to pull down in accordance with a line which should allow obstruction to the angle of 45°. Defendants having failed in the action they must pay the costs of it. Concluding, the Judge said that the friction which at one time existed between the plaintiffs and defendants having, he hoped, passed away, he would suggest that some scheme should be devised by the architects of each side whereby they could agree to allow more than this angle of light.

In reply to counsel, his Lordship said the injunction would not apply to pulling down the chimneys, and the operation of the injunction would be suspended for six weeks so as to allow the parties to come to some such agreement as he had suggested. It was left to the architects to the parties to fix the point at the bottom of the classroom windows from which the angle of 45° should be drawn.

MINUTES. VII.

At the Seventh General Meeting (Ordinary) of the Session, held Monday 6th February 1899, the President, Professor Aitchison, R.A., in the Chair, with 16 Fellows (including 7 Members of the Council), 27 Associates and several visitors, the Minutes of the Meeting held 23rd January 1899 were taken as read and signed as correct.

The following candidates for membership, found to be eligible and qualified according to the Charter and By-laws, and admitted by the Council to candidature, were recommended for election, viz.:—As FELLOW, Samuel Perkins Pick [*A.*] (Leicester); as ASSOCIATES, Walter Hargreaves Bourne [*Probationer* 1895, *Student* 1897, *Qualified* 1898] (Darlington); William Alphonsus Scott [*Probationer* 1889, *Student* 1895, *Qualified* 1898] (Drogheda, co. Louth); Ernest Jesse Mager [*Probationer* 1894, *Student* 1895, *Qualified* 1898]; George Reavell, jun. [*Qualified* 1898] (Alnwick); John Henry Arthur Phillips [*Probationer* 1894, *Student* 1896, *Qualified* 1898], Arthur Maryon Watson, B.A. Lond. [*Probationer* 1889, *Student* 1894, *Qualified* 1898], John Cubbon [*Probationer* 1892, *Student* 1894, *Qualified* 1898] (Manchester), Harry Inigo Triggs [*Probationer* 1892, *Student* 1898, *Qualified* 1898], Frederick Robert Hiorns [*Probationer* 1895, *Student* 1896, *Qualified* 1898] (Margate), John Kirkland [*Probationer* 1889, *Student* 1892, *Qualified* 1898], Edward Frost Knight [*Probationer* 1896, *Student* 1897, *Qualified* 1898], Harry Dighton Pearson [*Probationer* 1890, *Student* 1891, *Qualified* 1898], Leslie William Green [*Probationer* 1891, *Student* 1897, *Qualified* 1898], Henry Tanner, jun. [*Probationer* 1895, *Student* 1896, *Qualified* 1898]; as HON. CORR. MEMBER, Prof. Commendatore Felice Barnabei, General Director of Antiquities and Fine Arts Rome.

The President announced that the Council proposed to submit to Her Majesty the Queen the name of Mr. George Frederick Bodley, A.R.A., as a fit recipient of the Royal Gold Medal 1899, for his executed works as an architect.

A Paper, by Mr. A. Hessell Tiltman [*F.*], on PUBLIC BATHS AND WASHHOUSES, having been read by the Secretary, and discussed, a vote of thanks was passed by acclamation to the author. The proceedings then closed and the Meeting separated at 10 p.m.